DOCUMENT RESUME

ED 412 197 SP 037 574

AUTHOR Neill, Kweethai C., Ed.
TITLE The Student Issue. Original Articles by Student Gammans.
INSTITUTION Eta Sigma Gamma, Muncie, Ind.
PUB DATE 1997-00-00
NOTE 45p.; A special "Student Issue" is published annually.
PUB TYPE Collected Works - General (020) -- Reports - Research (143)
JOURNAL CIT Health Education Monograph Series; v15 n1 1997
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Acquired Immune Deficiency Syndrome; Attention Deficit Disorders; *Comprehensive School Health Education; Computer Assisted Instruction; Elementary Secondary Education; Graduate Students; *Health Promotion; Higher Education; Hygiene; Older Adults; Student Research; Violence
IDENTIFIERS Nutrition Education Research; Tai Chi

ABSTRACT

This issue contains eight articles on health education by student members of Eta Sigma Gamma, the National Professional Health Education Honorary. The papers are: (1) "Community Involvement: The Key to Successful Implementation of Comprehensive School Health Education" (Crystal L. Bieterman); (2) "HIV Infection and the Hispanic Woman: Implications for Program Planning" (Liliana Rojas); (3) "Nutrition Education in an Elementary Mathematics Curriculum" (Susan Thomas); (4) "Perceived and Demonstrated Handwashing Ability among College Aged Students" (Kirk R. Baker, Rashel Lwaton, and Beverly Tremain); (5) "T'ai Chi for Osteoarthritis among Older Adults" (Catherine A. Hartman); (6) "Unintentional Injury and Adolescents with ADHD (Attention Deficit Hyperactivity Disorder)" (Virginia McClelland); (7) "The Use of Computer-Assisted Instruction in Health Education" (Mollie Howerton); and (8) "Violence Prevention: A Health Educator's Perspective" (Susan C. Hill). An address list of reviewers and brief background information on the contributors are included. (ND)

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ED 412 197

Volume 15, Number 1
1997

The Health Education Monograph

Series

THE STUDENT ISSUE

ORIGINAL ARTICLES BY STUDENT GAMMANS 1997 EDITION

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Volume 15 Number 1
1997

The Health Education Monograph Series

Guest Editor
Kweethai C. Neil, Ph.D.
Department of Health
Sam Houston State University
Huntsville, TX 77341

Editor
Monograph Series
Mohammad R. Torabi, Ph.D., M.P.H., CHES
Chancellors' Professor and Assistant Chair
Department of Applied Health Science
Indiana University
Bloomington, Indiana 47405

Eta Sigma Gamma wishes to gratefully acknowledge the John P. McGovern Foundation for its generosity in helping to make this monograph series possible.

The Health Education Monograph Series is published by Eta Sigma Gamma, the National Professional Health Education Honorary, 2000 University Avenue, Muncie, Indiana 47306. A non-profit organization. Eta Sigma Gamma is dedicated to the elevation of standards, ideals, competence, and ethics of professionally trained men and women in the Health Science discipline. Third class, bulk-rate postage paid at Muncie, Indiana.

The Student Issue

ORIGINAL ARTICLES
BY
STUDENT GAMMANS
1997 EDITION

Volume 15 Number 1

1997

Published by Eta Sigma Gamma

National Professional Health Education Honorary

National Executive Committee
Eta Sigma Gamma

Dr. Kelli McCormack-Brown (President)
Department of Community & Family Health
College of Public Health
13201 Bruce B. Downs Blvd.
Tampa, FL 33612
Office - (813) 974-4867
FAX - (813) 974-5172

Dr. Beverly Mahoney (Vice-President)
Department of Health Education
The Pennsylvania State University, 1 White Bldg.
University Park, Pennsylvania 16802
Office - (814) 863-0435

Dr. Steve Dorman (Immediate Past President)
Department of Health Science Education
University of Florida, FLG-5
Gainesville, Florida 32611
Office - (904) 392-0583
FAX - (904) 392-3186

Dr. James F. McKenzie (Secretary-Treasurer)
Department of Physiology and Health Science
2000 W. University Avenue
Ball State University
Muncie, Indiana 47306
Office - (317) 285-5961
FAX - (317) 285-2351

Dr. Mohammad R. Torabi
(Editor - *The Health Education Monograph Series*)
Department of Applied Health Science
Indiana University, HPER 116
Bloomington, Indiana 47405
Office - (812) 855-4808
FAX - (812) 855-3936

Dr. Judith Luebke (Editor - *Health Educator*)
Department of Health Science
Mankato State University
Mankato, Minnesota 56002
Office - (507)389-1527
FAX - (507)389-5932

Dr. Roberta J. Ogletree (At Large)
Department of Health Education
Southern Illinois University
Carbondale, Illinois 62901
Office - (618) 453-2777

Dr. Robert Bensley (At Large)
Department of HPER
4024 Gary Center
Western Michigan University
Kalamazoo, Michigan 49008-3871
Office - (616) 387-3081

Dr. Loren Bensley, Jr. (Historian)
Department of Health Education
Central Michigan University
Mt. Pleasant, Michigan 48858
Office - (517) 774-3392
Home - (616) 386-5812

Ms. Donna Ganion (Executive Director)
Eta Sigma Gamma National Office
2000 W. University Avenue
Muncie, Indiana 47306
1-800-715-2559
Office - (317) 285-2258
FAX - (317) 285-2351
e-mail - etasigmagam@bsu.edu

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Foreword

First I thank Dr. Mohammad Torabi for entrusting this task of Guest Editor of this year's issue of the Student Monograph to me. The experience is both humbling and enlightening. It is a reminder that no matter how "organized" one plans to be ... "life always happens when you have other plans." Being Guest Editor this year gives me an even greater respect for and appreciation of "DEADLINES." It is enlightening in that a small "yes" can grow into such a big job!! I am also very touched by how willing my peers are to help me out when I needed it. Thank you Dr. Marty Wood, and Dr. Kelli McCormack Brown.

Second, I thank my colleagues nationwide for their dedication to the field in taking time out of their busy schedules to meticulously review and make constructive comments in the manuscripts. I see this as a valuable learning experience for our student contributors and have taken the liberty to send reviewers comments back to all the contributors. One can only see these comments as wonderful opportunities to grow and become better writers.

Third, I thank all those professors who have taken time to encourage and facilitate their students to write and produce manuscripts to this issue. Clearly many fine pieces were submitted which were fruits of numerous hours of labor in "sweating blood."

Fourth, and most importantly, I thank and congratulate all the contributors whose papers were selected for this issue. I thank and congratulate also all those who submitted manuscripts and encourage you to view this experience a step closer to getting your manuscript published.

Finally, I thank Ms. Julie Frasier, my able and efficient student assistant from the Department of Health and Kinesiology, Sam Houston State University, for doing whatever it took to make this issue possible.

Kweethai Chin Neill, Ph.D, CHES
Guest Editor
The Health Education Monograph Series
Sam Houston State University

Preface

On behalf of your National Executive Committee of **Eta Sigma Gamma (ESG)**, I would like to offer my sincere congratulations to all of the students who submitted research papers for publication consideration in this student issue of ***The Health Education Monograph Series***. This is a strong indication of our students' commitment to research. I would like to extend my genuine appreciation to Dr. Kweethai C. Neill for the excellent job she has done as our Guest Editor for this issue. Further, I wish to thank all faculty advisors who encouraged and worked with the students in the manuscript preparation, Kathy Finley for her assistance in preparing the final publication, and Joyce Arthur for her technical assistance. A special thanks is also extended to Ms. Donna Ganion, Executive Director of **ESG** for her general assistance. Certainly, I must thank the Department of Applied Health Science of Indiana University for the in-kind support provided for the publication of the **Monograph Series**.

I would like to invite all faculty to encourage students to submit research papers for the next student issue of ***The Health Education Monograph Series***. The deadline for submission is January 10, 1998. Our guest editor for the next student issue is Dr. Robert M. Weiler at University of Florida, Department of Health Science Education, FLG, Gainesville, FL 32611. His telephone number and Email address are (352)329-0583, rweiler@hhp.ufl.edu.

Finally, I would like to thank you for sharing your comments with me regarding the past **Monograph Series**. As always, I am eager to hear your criticism, comments, and suggestions relative to this publication. I do hope that you, as loyal members of this National Honorary, check your college/university libraries and make sure that they receive ***The Health Education Monograph Series***. If not, please request that they subscribe to these important publications. It is a privilege for me to serve **ESG** members and our profession.

I look forward to hearing from you.

Mohammad R. Torabi, PhD, MPH, CHES
Editor, ***The Health Education Monograph Series***
Indiana University

The Health Education Monograph Series

Volume 15, Number 1 1997

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Community Involvement: The Key to Successful Implementation of Comprehensive School Health Education

Crystal L. Bieterman

Abstract

Healthy People 2000 (1991) supports the establishment of comprehensive school health education (CSHE) in U.S. schools. In order to attain these goals, several aspects must be addressed. Key ingredients such as community involvement, thorough program planning, a coordinator (such as a health educator), and good public relations are important in the implementation of CSHE. Furthermore, barriers such as inadequate problem solving, the lack of funding, time, and resources, and misplaced personal values must be overcome. In spite of these barriers, many CSHE programs have been successful. The key to these successful programs lies in the integration of effort from both the school and community.

Introduction

Learning does not stop in the classroom. The community has an impact on children s behaviors and attitudes (DeGraw, 1994). It is difficult for the school to teach health topics if the community, including media, businesses, and parents, do not reiterate the same message. Also, the more a community is directly involved in the evolution of a program, the more support and advice it is likely to offer (Walker-Shaw, 1993). Dijkstra, DeVries, and Parcel (1993) state that the opposite is also true. If groups are not involved, their level of willingness to accept and utilize a program is low. Cognitive teaching alone is not sufficient to achieve behavior modification. As personal involvement increases and more senses are utilized, the individual will receive more educational benefits (Breckon, Harvey, & Lancaster, 1994).

Many goals for the U.S. are established through Healthy People 2000 (1991), each according to baseline data from 1987. Topics such as nutrition, tobacco use, school services, physician care, and injury prevention are addressed. Fifty-three percent of 20,000 teachers surveyed nation-wide view poor health as a major obstacle to learning (Schneider, Opas, & Donnelly-Crocker, 1993). This statistic emphasizes why comprehensive school health education (CSHE) is needed. Other benefits such as economic savings and improvements in the quality of education and health for the community are also offered through CSHE. The question of how to implement comprehensive programs is still unanswered. CSHE is only implemented in approximately 5% of U.S. schools (Carruthers & James, 1993; McGinnis & Degraw, 1991). It seems necessary, then, to incorporate not only the school, but also the community in this important effort.

The Key Ingredient For Successful Implementation Of CSHE

Community involvement is the key ingredient to successful integration of the schools and communities in order to implement CSHE. Committees composed of all groups involved including professionals, members of non-profit organizations, parents, the mass media, and school (teaching and non-teaching) staff are important (Allensworth, 1994; Carruthers & James, 1993). It is vital to involve individuals with good communication skills and those directly connected to the sources of funding (Aspen Reference Group, 1997). Committee members can assess needs, plan, implement, and evaluate programs with some guidance from a qualified health educator. This offers all interested members a chance to voice their opinions and to take ownership. Individuals are not as quick to criticize if they have personally helped to create the program.

A health educator should use these different groups to promote programs and changes. The group s tasks cover a variety of areas including presentations before legislatures and decision-making bodies (Killip, Lovick, Goldman, & Allensworth, 1987). These officials then become aware that their supporters demand these changes in their health education programs.

Another responsibility of the group concerns gaining support and recognition within the community through the mass media. As the awareness of CSHE within the community increases, the possibility of opposition may also increase. The committee must be prepared to acknowledge and defeat this opposition. They must also use statistics describing the health status of the community or school to help in demonstrating the need for program implementation to friends and neighbors (Rienzo & Button, 1993).

Good public relations are an important component of the committee efforts. It should be evident what services are available and how to access this assistance. Present and future needs should be addressed by these services. In addition, flexibility is important to allow each school to guide the program appropriately. Evaluation of similar programs are another key component in CSHE implementation. These evaluations offer support and help in identifying needs (DeGraw 1994; Rienzo & Button, 1993).

Breaking Down Barriers For Successful Implementation

Obstacles within the school and within the community

must be addressed before their actual linking can be accomplished. These factors include: inadequate approaches to solving problems, lack of funding, misplaced personal values, and lack of time and resources.

Recently, the emphasis for improving health has shifted towards early prevention, but all too often the basic causal factors are overlooked (Brindis, 1993; Reagan & Brookins-Fisher, 1997; English, 1994). The tendency is to break down problems and view them as separate entities, when in fact they are interconnected. This is an inappropriate approach to problem solving. By analyzing the ties among obstacles, a solution may be more feasible and adequate. A new term "antergism," coined by R. Weinberg and W. Charlesworth, describes the whole as less than the parts (English, 1994). Antergism refers to the decreased efficiency of problem solving as dividing and categorizing occur. This happens within and among schools, community agencies, medical professionals, and policy makers. The following quote sums this up best: "The results are fragmented issue-specific programs. This inefficient unrelated approach to health education has limited the ability to provide effective integrated education that look at youth as whole people" (English, 1994, p.188).

Funding for long term programs is inadequate and poses another barrier to implementing CSHE. Problems with funding exist despite state mandated changes (Bruininks, Frenzel, & Kelly 1994). Frequently programs are developed, but not carried through due to depletion of funds. To implement and maintain behavior modification, time and money are required. Funds should be derived from numerous sources (Brindis, 1993). To have success in fund raising, data from the needs assessment are most helpful. If more money and time are taken when developing needs assessments, programs will gain more support and be better equipped to deal with challenges (DeGraw, 1994; Schneider, et al., 1993).

Dijkstra et al. (1993) have emphasized the diffusion process in developing a program. This concept is best explained through the use of a simile. The process is like a topical drug, as it slowly seeps into all of the involved members and systems, awareness or relief occurs with a lasting effect. A quick fix to a problem should not be the goal. Rather, the goal should be a solution that will continue to function over time, which includes long term planning and long term funding.

The role that values and attitudes play in establishing CSHE is often an overlooked obstacle. Controversial issues in the classroom pose a challenge as all teaching is essentially value-laden (Cresswell & Newman, 1993). Because some health issues are controversial (such as sexuality, tobacco), politicians, administrators and some professionals try to avoid them (Bruininks, et al., 1994; Butler, 1993). This may be a result of insufficient education, misinformation, economics or simply because the programs may be politically hot in certain areas of the country. It also ties into the lack of time in the school year to cover all of the issues. Thus, those issues with the most priority and least controversy will be taught first.

The lack of time is a major obstacle to implementing CSHE in the schools (Butler, 1993). There are so many requirements and so little time in the school year that only those courses specifically allotted time receive emphasis. In a North Carolina study, teachers reported addressing the academic courses such as English, Math, and Science first because kids take national tests in these areas. In the meantime, health education remains on the back burner until these tests are finished (Smith, McCormick, Steckler, & McLeroy, 1993). Extension of the school year or school day may prove beneficial in decreasing the time crunch and the pressure to rush or omit important issues. Better yet, mandatory testing should be expanded to include health to ensure that health will be taught.

Limited resources such as adequately trained educators is a dilemma faced by the expansion of health education. There are many individuals in the work force knowledgeable about health, but many of them are not properly trained to be educators, nor can they develop programs to improve health. For example, in North Carolina, teacher training had a significant benefit on the maintenance of health education programs (Smith et al., 1993).

Examples Of Successful Programs/ Interventions

Despite numerous barriers already discussed, successful programs have been created. In Europe, expanding the scope of health education has become a focus of many schools. In 1990, a national conference involving twelve states began a coalition, with a goal of using groups to formulate guidelines for teacher and student expectations (Williams & Jones, 1993). The plan for ensuring this expansion of Europe s health education includes three main parts. First, each state organized a follow-up conference, created a summer school teacher training focusing on integrating the schools with the community, and planned to support different health promotion programs in each of the twelve states. Overall, these efforts aided the expansion of health education into the curriculum. Currently, health topics are being introduced during class discussion periods and a one-year training course in health education is being offered for teachers to ensure adequate preparation (Williams & Jones, 1993).

This coalition has expanded its focus from the traditional school curriculum to include factors such as school policies and how these policies relate to the students mental and physical health. The strength of peer interactions and teacher and parental role models are also addressed. The interests of the current communities have directed the topic of emphasis for the last few years. Studies showed that parents and other members of society will offer much more support when they have a personal interest invested. The World Health Organization has also assisted by supporting projects throughout Europe to help with evaluation of these programs (Williams & Jones, 1993).

Just as school health policies related to health issues have been a focus in Europe, so too are they a focus in other areas

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such as Colorado. The Colorado Tobacco Policy has met with tremendous success in the schools. When classroom teaching on the dangers of tobacco are reinforced and supported with a tobacco-free policy in the school, the children are less likely to use tobacco. Teachers and parents who avoid tobacco help by being role models, which are a key influence on children s behaviors (DiGiacomo Peck, Acott, Richard, Hill, & Schuster, 1993).

Many beneficial points were derived from a program at Colorado State University. This program serves a wider audience and increases involvement of young people, including those in over 1000 4-H Clubs and 250 chapters of STAND (Students Taking A New Direction). These interactions add to the peer education component with members of STAND presenting to other students as well as to the community. As a result of these groups, the number of school districts free from tobacco has increased from 5% in 1988 to 45% in 1992 (DiGiacomo Peck et al., 1993).

Another program bringing together the school and the community agencies is "Young and Healthy." "Young and Healthy" is an example of networking between the school nurse and medical professionals within the community. In this program, volunteer medical professionals are able to provide limited, but usually same-day, care to uninsured children who are referred by the school nurse. The need for this program evolved due to the lack of health insurance, preventive care, and check-ups. It has functioned in twenty-six schools in the Pasadena, California school district. In 1992 there were 625 referrals, and at least 75% were able to receive same day and follow-up care when needed (Schneider, et al., 1993).

Safety belt education is another program which found success through integration of the community and school. Safety belt usage increased 21% and 19% in male and female students, respectively. The program focused on using students in all phases of the program. Selected students were properly trained to record and collect data on seat belt usage. The data was used as motivation for the children to observe how their classmates measured up. A visual demonstration was also performed. It included several presenters; a police officer, a woman with paraplegia, an emergency medical staff member, and some students from the school. Each individual discussed how an auto crash (without the use of a seat belt) had affected their daily lives. The students from the school demonstrated the acceleration and crash principle. Following the skits, contracts were signed by some students indicating that they would wear a safety belt each time they were in a motor vehicle. During the ten week period of the contract, selected students assisted by distributing prizes to those who fulfilled their commitment to wearing a safety belt. These prizes were offered on a random basis during the ten weeks. The goal was to continually spur excitement and enthusiasm for the program (Bross & Spellicy, 1994).

Community and school can be combined to reach a wider range of individuals in a more comprehensive manner. Schools receive the benefit of networking, improving retention levels, and advancing more students closer toward graduation. The educator may also begin to network with volunteer agencies, such as the American Cancer Society, American Dairy Council, and others who offer a wide variety of services and educational materials at reasonable or no cost. In return, the community agency is given exposure and a captive audience, and good public relations are established which may lead to support in the future (Killip et al., 1987). These joint efforts may result not only in a healthier learning environment, but also in a healthier community. Some day these children will have families of their own, and their decisions and lifestyles will affect everyone's future.

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HIV Infection and the Hispanic Woman: Implications for Program Planning

Liliana Rojas

Abstract

HIV infection among women is growing rapidly in the U.S. AIDS cases among Hispanic women are almost three times that of White women, thus posing a serious need for prevention education. Because health educators are responsible for attaining sensitivity to social and cultural contexts of their target groups, this paper identifies the factors related to HIV infection in Hispanic women and the implications for health educators. Cultural competence guidelines are presented and explained in the context of HIV prevention education that targets the female Hispanic community.

Introduction

Rates of HIV infection among women in the U.S. increased markedly during the past decade, more than for any other demographic group. An estimated 80,000 American women were infected by the end of 1993 (Clark, Hankins, Hein, Mitchell, & Williams, 1993). Despite the obvious increase in incidence, prevention education efforts have remained stagnant. The role of gender, social status, and sexual risk behaviors of women largely have been ignored in the efforts to reduce HIV infection (Amaro, 1995). Health educators have an opportunity to intervene and promote the development of specifically designed HIV prevention education programs for women. This paper examines current knowledge about factors affecting the need for increased HIV prevention efforts focused on women, especially Hispanic women.

A definition of 'Hispanic is necessary to create a context in which this information can be utilized. The Hispanic (Latino) population of the U.S. includes people of Mexican, Puerto Rican, Cuban, Salvadorian, Nicaraguan, and Dominican origin. This population includes both recent immigrants and U.S.-born citizens. The Hispanic population also includes persons of Central and South American descent. Spanish speaking persons often are viewed collectively as belonging to one group: Hispanic. In reality they constitute a very heterogeneous group. Different cultural, social, religious, racial, and language aspects are represented in this group. Thus, health educators should recognize the customs, rules, and etiquette of each population (U.S. Department of Health and Human Services [USDHHS], 1990).

HIV Infection Among Females

According to House and Walker, "AIDS education is the only effective method of reducing the transmission of HIV disease" (1993, p. 282). Experts in the field generally support this view, further emphasizing the importance of well-designed and systematic approaches to HIV education. Consideration of and sensitivity to gender differences, sociocultural factors, and barriers to behavior change are crucial to the effectiveness of health educators in HIV prevention efforts. It is important to explore the uniqueness of HIV infection among all women to fully understand its unique implications for minority groups, particularly Hispanic women. Several facts should be considered regarding HIV infection among women, including incidence and routes of transmission, as a means to understand the implications for health education.

In the decade preceding 1994, the number of AIDS cases among women rose from 534 cases (7 %) to 14,081 cases (18 %) of AIDS (Horton, 1995). One-fourth of all AIDS cases through 1994 were reported in that year, showing the marked change in trends of infection among women (Centers for Disease Control [CDC], 1995a). This increase in prevalence places AIDS as the fourth cause of death for all women and the leading cause of death for women ages 15-40. The numbers are increasing at a rate of 17 % per year ("Women, AIDS", 1995).

Aside from the effects of HIV infection to women, consideration also should be given to the implications for the children of HIV-positive women. The rate of transmission for HIV-positive mothers to their infants was found to be nearly 30 %. Approximately 7,000 HIV infected women give birth each year, placing AIDS as the seventh leading cause of death for children ages 1 to 4 ("Women, AIDS," 1995). Clinical trials demonstrated success in decreasing the rate of vertical transmission (mother to child) from 30 to 8 % with the use of Zidovudine (Horton, 1995).

Routes of transmission for HIV among women also must be reviewed to fully comprehend the implications for health education. The breakdown of transmission routes for women with AIDS in 1994 reflects an almost even split between interjected needle infection and heterosexual transmission. Heterosexual contact accounted for 38 % of the cases, while interjected drug use (IJDU) accounted for 41% (Horton, 1995). According to Arno (1996), male-to-female

transmission can be 15 to 20 % more likely to occur than female-to-male transmission. Risk factors include sexual contact with an individual in the advanced stages of the disease, presence of genital sores, unprotected anal intercouse, or failure to use latex condoms during vaginal intercourse (Arno, 1996). Therefore, addressing IJDU alone will not suffice, and comprehensive HIV prevention including behavior-specific programs will be critical.

Having established the impact of HIV infection for women, the need for prompt and proper action is evident. Despite current interventions and numerous efforts, a need still exists for further research and development in this area. HIV affects all women, but disproportionately affects minority women. Over two-thirds of AIDS cases in the U.S. are diagnosed among African-American and Hispanic women (Horton, 1995).

The Risk to Hispanic Women

Comparisons of the National Census data (U.S. Dept. of Commerce, 1994) and data from the Florida Department of Health and Rehabilitative Services State Health Office, (1996), state and national AIDS Surveillance Reports (CDC, 1995a) show a marked disproportion between the number of AIDS cases and the Hispanic segment of the population. Overall, Hispanics represent 9 % of the U.S. population but have a significantly higher proportion of the AIDS cases (17.2%) (Amaro, 1995). Furthermore, Hispanic women represent 20 % of AIDS cases among women. This percentage is approximately three times greater than the proportion of Hispanic females in the U.S. (Deren, Shedlin, & Beardsley, 1996). The number of infected Hispanics is probably higher than estimated, since records do not take into account undiagnosed cases or those of illegal immigrants (Jimenez & Jimenez, 1992).

The main route of transmission of HIV for Hispanic women is IJDU (48%), with heterosexual intercourse ranking as the second route with 36 %. However, the rate of heterosexual transmission has increased, and will continue to do so, among women in minority groups. Despite studies showing the primary routes of infection for Hispanic women, few HIV-related studies examined heterosexual transmission among this group (Deren, et al, 1996).

Factors that influence high rates of heterosexual transmission among Hispanic women include the presence of multiple partners to their primary male partner, low rates of condom use, and issues of cultural and religious heritage. According to a recent study, married Hispanic men were more likely than their White counterparts to have had two or more heterosexual partners the previous year (Marin, Gomez, & Hearst, 1993). Other studies show that Hispanic women are less likely to use condoms than their White counterparts, thus increasing their risks for HIV infection (Marin, Tschann, Gomez, 1993). The proportion of Hispanic women with AIDS also reflects a multifaceted cultural domain. As summarized by Deren (1996), it is important to study the difference,

> between Hispanic subgroups to identify cultural beliefs or behaviors that may be important in developing intervention strategies .... This has been underlined by studies indicating that the HIV epidemic among Hispanics reflected cultural norms, exposure modes based on birthplaces and U.S. communities of residence, and the relationship between acculturation and HIV risk behaviors and beliefs (p. 336).

Despite injected drug use being a primary route of HIV transmission, women who are injected drug users are at greater risk for HIV infection through their heterosexual practices. The most rapidly increasing transmission category among women involves heterosexual contact (CDC, 1995b). Although Hispanic women are over-represented in comparison to their White counterparts in the number of AIDS cases, they also have a higher death rate (Worth & Rodriguez, 1987). Also, as part of a minority group, Hispanics share a history of discrimination for minorities in education, employment, and housing (Holmes, 1991). These factors make the development of sound educational programs for Hispanic females that much more challenging.

Other contributors to the high incidence of AIDS among women and Hispanic women include the under-diagnosis and lag in treatment research of HIV infection in women. The pattern of early illness is markedly different between men and women. Women have recurrent episodes of vaginal candidiasis and pelvic inflammatory disease, increased frequency of human papillomavirus infection and squamous intraepithelial lesions, and reduced incidence of hairy leukoplekia (Horton, 1995). These indications of early HIV infection are often missed in women. This helps explain why "HIV-infected women are one-third more likely than HIV-infected men to die without an AIDS-defining condition" (Horton, 1995, p. 531).

Research is needed in the specific progression of the disease in women, including the different stages and early diagnosis. Not until 1987 did CDC s case definition of AIDS change to include conditions unique to women with AIDS. Women were dying from AIDS without ever meeting the diagnostic criteria (Corea, 1993). This fact emphasizes the need for additional studies not only in the realm of medicine but in health education.

Implications for Program Planning

Implications of a diverse cultural and religious heritage must be considered both in the design and implementation of health education programs. Health educators should be sensitive to the social and cultural contexts of their target groups. This objective does not exclude target groups dif-

ferent from the educators own group. Ka Opua (1992) cited four key concepts related to bridging cultural differences: (a) self-awareness, (b) knowledge of the topic, (c) respect, and (d) willingness/ability. Cultural competence involves a specific set of values, attitudes, knowledge, and skills.

Four terms summarize the competencies a health educator should possess to achieve cultural proficiency: (a) cultural sensitivity, (b) content cognizance, (c) genuine commitment and (d) cross-cultural education skills (See Berlin & Fowkes, 1983; Ka Opua, 1992; Croteau, Nero, & Prosser, 1993; USDHHS, 1990; & Worth, 1987). Cultural Sensitivity refers to an educator s ability to identify, respect, and acknowledge the values, beliefs, and attitudes of others, to use that ability in planning and implementing educational programs. Content Cognizance defines the knowledge base of the content area. If the content area involves nutrition, then it refers to the health educator s knowledge about nutrition in that target group. Genuine Commitment represents the educator s honesty, empathy, and open-minded dedication to the target group. Cross-Cultural Education Skills include the ability to carry out educational practices specifically sensitive to the target group. This aspect includes activity and lesson plans that specify culturally relevant topics, reading level, setting, and delivery methodology.

In addition to the basic competencies concerning health educators for culturally diverse groups, the Hispanic female population presents other challenges. Hispanics generally are more likely to be under-educated with one-half the likelihood to attend college of their White counterparts (Holmes, 1991). This fact directly affects the women s status in regard to their vulnerability and likelihood for behavior change. Holmes (1991) speculates that, like African-American families, Hispanic families are likely to achieve only one-third the net worth of White families in middle-income levels.

Hispanic women are at special risk for HIV infection due to their cultural heritage, which includes two predominantly strong constructs in the Hispanic culture, Marianismo and Machismo. Marianismo is a construct in which suffering is an essential virtue for women, an experience related to concepts such as virginity, chastity, honor and shame. This cultural construct portrays women as subservient to men, a situation in which women defer the sexual decision-making process to men. Its masculine counterpart, Machismo, portrays men as virile and manly if they impregnate a woman, the perpetuation of manhood (Melhuus, 1990). Further, the Hispanic cultural norm that places the role of caretaker on the women impedes her from caring for herself before her husband or children. Worth (1987) also explains that Hispanic women become isolated when stripped of family support since they are unaccustomed to seeking help outside their extended family. This isolation may reinforce misconceptions and misinformation about health issues, adding yet another issue for health educators when determining the resources available to the target group.

Conclusion

Cultural values and attitudes of the female Hispanic population about sexuality and drug use can hinder HIV prevention efforts (House & Walker, 1993). However, through specifically designed and culturally sensitive programs, efficacy can be easier to achieve. Recommendations for competence in cultural proficiency can help alleviate the gap between the need for HIV prevention and efficiency of existing programs, as well as help in developing new programs. Thorough consideration of the specific needs of women, Hispanic women, and educational incentives for targeted populations plays a role in bridging the gap (USDHHS, 1990). This approach to the sensitive issues of cultural patterns, attitudes, and behavior provides a guide to addressing implications for health educators in reaching Hispanic women in HIV prevention efforts.

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Nutrition Education in an Elementary Mathematics Curriculum

Susan Thomas

Abstract

Current scientific research leaves little doubt that a strong link exists between nutrition and disease. Dietary habits often are developed in early childhood and reinforced during the early years of adolescence. Elementary teachers have come to realize the need for nutrition education, but face obstacles such as lack of time and an unstable health education curricula. In order to overcome these barriers to nutrition education, elementary educators are integrating nutrition education into other academic disciplines, namely mathematics. Each subject complements the other and helps to achieve learning objectives in nutrition and mathematics. It is vital that new and innovative strategies such as integrated curricula be implemented to educate youngsters about positive nutrition at a time they are developing the dietary patterns they will practice for a lifetime.

Introduction

Foods high in fat and calories, but low in nutritional value, are linked to the top three causes of death in the United States which are heart disease, cancer, and stroke. Leading national organizations recommend eating foods which are low in fat and cholesterol, increasing consumption of fruits and vegetables, and increasing intake of dietary fiber for preventing these leading causes of death as well as many other chronic diseases (American Cancer Society,1995). The major causes of death and disease in the U. S. often are affected by behaviors learned early in life (Smith, McCormick, Steckler, & McLeroy, 1993). Selection of foods in adolescence and young adulthood contributes greatly to patterns of growth and development, as well as the incidence of disease and obesity later in life (Shannon, Mullis, Bernardo, Ervin, & Poehler, 1992).

Research indicates adolescents are eating foods with high caloric content and low nutritional value (Lenhard, 1996; McPherson, Montgomery, & Nichaman, 1995). The Youth Risk Behavior Survey (YRBS) reported that consumption of five or more servings of fruits and vegetables during the day preceding the survey had decreased among all age groups. Consumption of two or more servings of high fat food also was more common among 12-13 year olds, when compared to older age groups (U.S. Department of Health and Human Services [USDHHS], 1994). It is important to address the issue of reducing poor nutrition which puts children today at risk for poor health tomorrow.

Comprehensive School Health Education

Schools are uniquely equipped to deal with problems and issues which affect health (Hawkins & Catalano, 1990). Children spend over 15,000 hours of their adolescence at school. Allensworth and Kolbe (1987) said that schools could do more than any other single agency in society to help young people, and the adults they become, to live healthier, longer, more satisfying, and more productive lives. As an institution, schools can respond to each student s basic need for health education, including the student s need to develop skills for independent thinking and decision making (Iverson & Kolbe, 1990). The response by schools, government, and others concerned about the health of youth involved targeting students in school for grades K-12 through Comprehensive School Health Programs. These programs seek to provide all students, from the time they enter school, with planned, systematic, and ongoing learning opportunities which help them make health-enhancing decisions (Seffrin, 1990).

Recent federal initiatives directly address policies concerning school health. Over 100 of the National Health Promotion and Disease Prevention Objectives for the Year 2000 relate to school-age children and youth, many of which focus on education in specific categorical areas (Lavin, 1993). Comprehensive School Health Education involves a broad-based effort to expose students to a range of cognitive, affective, and skill development opportunities which contribute to overall competence with respect to health. Comprehensive health education programs stress acquisition of knowledge and skills with emphasis on decision-making, practical application, and values education (DeFriese, Crossland, MacPhail-Wilcox, & Showers, 1990). Nutrition education represents a necessary and important component of comprehensive school health programs (Contento, Kell, Keiley, & Corcoran 1992).

Integration of Nutrition Education

Recently, a strong interest in interdisciplinary approaches to program planning and problem solving has emerged as part of the movement to restructure the American education system. This interest is beneficial for those who believe in promoting health instruction in schools.

Health education proves maximally effective when traditionally separate disciplines work together (DeFriese et al., 1990). According to Nader (1990), for school health education to positively affect behavioral, attitudinal, and knowledge-based outcomes, health instruction should be integrated into other content areas as well as the health curriculum. Many curriculum specialists believe that health should be taught through the "infusion model". Topics related to health such as exercise, HIV/AIDS, and nutrition lend themselves well to integration with instructional programming into traditional subjects such as language arts, science, social studies, and mathematics (DeFriese et al., 1990).

For some teachers at the elementary level, nutrition education is just one more topic to be covered in an already full day. Yet, in a survey of elementary and secondary school teachers in Nevada, 74% of respondents reported teaching nutrition in the past year (Woodson, Benedict, & Hill, 1995). One method teachers have employed to bridge the gap between lack of time and the necessity for nutrition education involved the use of an integrated curriculum, where nutrition instruction was integrated into core subject areas (Lytle & Achterberg, 1995). Subjects such as science, social studies, and mathematics were used to teach basic components of healthy eating.

Levels of Integration

An integrated curriculum combines topics from two usually separate disciplines or subjects into one common lesson plan. The teacher determines which subject areas enhance or enrich one another when they are taught together (Lapp & Flood, 1994). Educators can approach integrating the curriculum at several levels. In a correlated curriculum, teachers of all subjects deal with one topic at the same time. For example, a theme of nutrition could be discussed in a Social Studies class on foods of different countries, in a mathematics class on how to determine the caloric content of different foods, and in a health class on positive food choices. Fusion takes integration one step farther by combining two or more subjects into a new course with a new name, such as Common Learnings or American Studies. A structured core curriculum is currently the most advanced method of curriculum integration. Needs, problems, and concerns of particular groups of students are identified, and skills and subject matter for any applicable subject are brought together to help students deal with those matters.

Educators also may identify a cluster of student concerns or issues that they feel are typical for the age group and design units of study relevant to those students. This approach represents the ultimate student-centered integrative curriculum. In an unstructured core, the teacher and students jointly decide on specific questions for study, how the unit will be carried out, and how student progress will be evaluated (Vars, 1991). Regardless of the method of curriculum integration employed, the topic being taught should make integration natural or even necessary (Allenman & Brophy, 1993).

Nutrition and Math in an Integrated Curriculum

Many of the guidelines for healthy eating are based on quantities (i.e., 2 servings of dairy products), proportions (i.e., 1 serving of pasta = ˚ of a cup), and classification and sorting (grouping foods into the food guide pyramid), which also are important mathematical concepts at the elementary school level. In the case of nutrition education, several concepts naturally lend themselves to a certain level of integration with mathematics. For example, the basic Food Guide Pyramid encourages sorting and classification, fundamental concepts in elementary mathematics and a basic tenant of positive nutrition.

Worthwhile integration implies that a single activity accomplishes significant curricular goals in two or more subjects simultaneously (Allenman & Brophy, 1993). Consider the computation number of calories from each of the basic macronutrients (fats = 9, proteins = 4, and carbohydrates = 4). A lesson on this topic teaches multiplication as well and shows how high fat foods may contribute to excess calories in the diet. According to Palmer (1991), educators must try to help students understand the information they are learning in some real context. Unless students recognize the connections between and among facts they learn in their separate courses, they will not understand what was, what is, and what will be. Integrated or cross-curriculum teaching adds meaning to learning. Students in various types of integrative/ interdisciplinary programs have usually performed as well or better in standardized achievement tests when compared to students enrolled in separate subjects (Vars, 1991).

Educators in both health and mathematics would benefit from integration of curricula. Health education practitioners often are advised to develop and implement curriculum units which integrate other academic disciplines into health education to increase the meaningfulness and application of health education across the school curriculum (Cinelli, Rose-Colley, & Betchel, 1995). Mathematics educators also are encouraged to do the same. "When taught in meaningful, compelling ways, math is really fun!"(Ohanian, 1992, p.44). Student organization, preparation, and presentation of simple foods provides a way to apply various mathematical concepts (Brumfield & Firkins, 1994). The National Council of Teachers of Mathematics (NCTM) says that the best mathematics activities grow out of problem-solving situations. Students should be given opportunities to gain problem solving skills in meaningful, experiential ways (McGehe, 1991). Elementary schools which have implemented cross-curriculum or integrated curricula have recognized that students learn more, remember more, and are able to apply their knowledge (Palmer, 1991; Lapp & Flood, 1994).

As an illustration of this approach, Cinelli et al (1995), described a teaching activity entitled Curriculum Integration. The target audience included health educators or teachers working with elementary-age children. This activity seeks to help educators develop learning strategies that integrate the concepts of social studies, science, math, reading, language arts, music, art, and physical education into the six health content areas of nutrition and fitness; personal health; family life; community and environmental health; injury prevention and control; and drugs, alcohol, and tobacco. One specific example in the activity involves having students calculate and conduct a nutrient analysis of various foods. The integrated learning activity must be age-appropriate and combine the health topic into a traditional academic discipline.

Model Lesson Plans

Educators have devised numerous approaches to developing lesson plans that combine traditional curriculum areas, such as mathematics, with nutrition. The following five activities provide examples of those approaches.

Supermarket Challenge is a learning activity focused on three key areas: a study of nutrition including foods associated with the four basic food groups; calculator use; and an in-depth study of graphing which included tables, picture graphs, line graphs, bar graphs, and circle graphs. The teacher objective sought to integrate mathematics with other curriculum areas and draw on a real-life situation to motivate and interest the students. The students were divided into groups and each group was given a cash register receipt. They were asked to classify the foods into categories (i.e., junk food, dairy, fruits and vegetables). Each group then presented their classifications in a picture graph, bar graph, circle line graph, and a broken line graph. The teacher felt that students had gained a number of skills from the unit. The students learned to compare nutritional content in foods, decode grocery store symbols, and estimate the cost of everyday products, all in addition to graphing (Axelson, 1992). This lesson used real life examples to illustrate concepts in both mathematics and nutrition simultaneously.

A lesson which uses the grocery store setting is "5 and 3 Store." In this particular class, the teacher and students set up a grocery store complete with aisles, shelves, cash registers, and groceries (empty boxes and containers). Students were told that the grocery store was set up for a lesson in consumer mathematics. Prices of items were marked in comparison to what they would cost at a local grocery store. Each member of the class was given $20 in play money. Students had 40 minutes each day to visit the store. Some students quickly discovered that they did not have enough money to pay their grocery bill. Students learned to appreciate the value of their money, use a sales tax sheet, make change, and become better estimators. The most important lesson, however, was learned by the teacher.

After evaluating the activity, she decided on some changes to be implemented at the next "5 and 3 Store." The revised unit includes a discussion about and emphasis on nutrition and the basic food groups, proper meal planning, and the effect of a poor diet on the body (Harvey, 1994).

Change the Course is an American Cancer Society curriculum which shows children the link between nutrition and health (Light & Contento, 1989). It encourages students to adopt lifelong eating patterns which not only are healthy, but may also decrease their risks for developing diet-related cancer or other chronic illness. Based on ACS guidelines, the program addresses three behavioral goals: (1) To eat a variety of vegetables & fruits, (2) To eat more high fiber foods, and (3) To eat less fat and fewer fatty foods. This flexible curriculum can be taught as a health education curriculum or as an interdisciplinary curriculum. Many of the activities can help build skills in science, language arts, or mathematics. One key factor in the program's success and effectiveness involves integrating nutrition education into the core curriculum. All teachers, except for one first grade teacher, felt that the curriculum could be incorporated into what they currently teach, including mathematics (Contento et al., 1992).

My Superbowl of Favorite Foods is another example of integrating mathematics and nutrition involves an activity where students record all of the foods they eat in a 24-hour period. The foods consumed are recorded in five categories: dairy, meat and substitutes, grains, fruits and vegetables, and other. Ideal amounts of servings, based on the Food Guide Pyramid, are listed at the top of the chart. Students then determine whether they exceed or were deficient in any of the food categories. Students must learn to add and subtract to balance the proper foods in the correct category. Two objectives of learning the proper amount of different foods to consume in a 24- hour period, and of using mathematical operations such as addition and subtraction were achieved. The final part of the assignment asks the students to summarize all the changes their diet may require in a formal resolution (Trede, 1992).

Pyramid Picks is a nutrition education module from Pennsylvania using the Food Guide Pyramid as the focus for an elementary school intervention. Though not implemented directly as part of a mathematics curriculum, many of the activities involved basic mathematical concepts. At the kindergarten and first grade levels, students discussed foods from each section of the Pyramid, its relative size in the Pyramid, and implications of its size for the recommended number of daily servings. The activity included an interactive discussion between the leader and the children. Through their participation, the students learned concepts of classifying and sorting foods in terms of number and importance with relation to principles of the Food Guide Pyramid.

In the upper elementary levels (grades 2-5), students in each class were divided into four groups—Breakfast, Lunch, Dinner, and Snack. Students selected from a

table of food models a menu they considered desirable for their particular meal before they were introduced to the Food Guide Pyramid. They were led in a similar discussion as were the kindergarten and first graders. Next, students revealed their earlier selections, then they decided how successful the whole class had been in determining the recommended number of serving from each food group. Trained parents assisted the class in calculating the number of servings per food group in each meal. To properly determine serving sizes, students used mathematical operations such as addition and subtraction (Malyn, 1993).

Conclusion

Comprehensive School Health Programs have demonstrated effectiveness in improving knowledge, attitudes, and behavior. In the past, however, limited attention was given to future distribution of materials (Olson, Devine, & Frongillo, 1993). Healthy Youth 2000 (USDHHS, 1993, p. 345) lists as a major objective to "Increase to at least 75 percent the proportion of the nation s schools that provide nutrition education from preschool through 12th grade, preferably as part of quality school health education." Time constraints, lack of a stable health curriculum, or other barriers often prevent quality school health education. In America s elementary schools, many teachers have tried to overcome these obstacles by integrating nutrition education with other core curriculum subjects, such as mathematics, reflecting a cross-curriculum or integration approach to these two topics (Contento et al., 1992; & Dubinsky & Bodner, 1991).

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Perceived and Demonstrated Handwashing Ability Among College Aged Students

Kirk R. Baker, Rashel Lwaton, & Beverly Tremain

Abstract

The relationship between perceived and demonstrated handwashing ability among college students was examined in this study. Additionally, gender and previous handwashing education were examined for a relationship to demonstrated handwashing ability. This study took place on the Truman State University campus in Kirksville, Missouri (n = 63) (16 female, 47 male). An experimenter designed survey obtained information concerning how well the subjects perceived their handwashing in terms of its effectiveness in reducing dirt and bacteria. The Nebraska Health Department s handwashing procedures for nurses was modified, with permission, by the experimenter into components relevant to proper handwashing in a public restroom. Each subject was scored using a list of 12 items necessary for good handwashing. Perceived and demonstrated handwashing ability among college students was significantly correlated (p = .018). No differences existed between gender and demonstrated ability (p = .959).

Introduction

Personal hygiene is a fundamental component of health that is often overlooked but is an important component of disease prevention. Hygiene promotion is increasingly being focused as an intervention strategy to control the spread of disease (Baltazar & Tiglao, 1993). It is therefore worth considering why more college wellness classes do not incorporate proper handwashing technique into the class curriculum. Common hygienic practices such as proper handwashing is one of the most effective ways to prevent the transmission of infectious pathogens (Cassens, 1992). Positive hygienic practices provide a healthier host who is less susceptible to the agent or environment in the epidemiological triangle (Lilienfeld & Stolley, 1994). Handwashing is an important way to prevent the spread of infection and disease since pathogens get on hands and subsequently are moved to the face, mouth, or other individuals (Weed, 1989).

The most important place to perform proper handwashing technique is in the public restroom since large numbers of individuals make use of these facilities on a regular basis. Washing your hands after blowing your nose, touching your hair, and using a restroom are hygienic practices considered common sense. Handwashing is defined as a vigorous, brief rubbing together of all surfaces of lathered hands, followed by rinsing under a stream of water. Transient microorganisms are effectively eliminated from the skin by handwashing with plain soaps and detergents (Garner & Favero, 1985).

The recommended handwashing technique depends on the purpose of the handwashing. Ideal duration is not known, but washing times of 10 to 15 seconds have been reported as effective in eliminating dirt and bacteria (Garner & Favero, 1985). A much more rigorous handwashing procedure is necessary to prevent nosocomial infections in hospitals. This procedure is not considered necessary outside this setting and a more general technique modeled from the definition of handwashing is appropriate for public restrooms. A survey instrument for this study was created by modifying hospital handwashing guidelines for nurses into components that fit the standard handwashing definition. Demonstrated ability was compared with student self-efficacy, or how effective they perceived their handwashing ability in terms of reducing dirt and bacteria.

Communicable diseases run rampant on college campuses as students are continually susceptible to disease due to the high levels of stress and lack of sleep (Hooley, 1996). The exposure to a different pool of pathogens when students first arrive at campus also works against the student s health (Hooley, 1996). Handwashing is the best method to prevent the spread of common illnesses such as the cold and flu in a high risk population (ETR Associates, 1996). This study examines the relationship between students perceived handwashing ability and demonstrated handwashing ability. Additionally, relationships between gender and previous handwashing education were examined.

Method

Preliminary Procedures

Approval to use human subjects was obtained by the Truman State University Institutional Review Board prior to testing. This committee was made aware of the nature of the study in addition to any benefits and consequences to the subjects.

Participants

Participants included 16 male and 47 female Truman State University students who attended classes during the Fall semester of 1996. All subjects (n = 63) were obtained from

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Health Education and First Aid & CPR classes.Professor's permission to approach and use students as subjects was obtained by the researchers. Students were recruited by researchers during regular class sessions and informed about the nature of the study and the potential benefits and consequences of the study. Steps were then taken to randomly select the subjects. Students were given a blank note card or one showing an s. Students who received the s card were asked to participate in the study. The subjects were randomly selected to eliminate bias from being introduced into the study and compromising internal validity. They were then asked to perform the test in the Human Potential and Performance lab, located in the same building.

Protection of Human Subjects

Informed consent was obtained prior to participating in the study. Students were verbally instructed that they were free to terminate participation at any point during testing and were under no obligation to complete the test. The data sheets were shredded at the conclusion of the project.

Description of the Instrument

This study used a modified form of the Nebraska Health Department s steps for proper handwashing for nurses (Weed, 1989). The steps were modified to be relevant to a population not employed in a hospital setting. This was done by incorporating components from the nursing procedure that fit the requirements of public restroom handwashing.

The two experimenters reviewed the survey instrument and conducted an interrater reliability study. Twenty subjects were observed by both experimenters. Data were analyzed with a Pearson two-tailed correlation test. The p-value was less than .001 so interrater reliability is an unlikely source of error in this study.

Each subject was asked how often they wash their hands per day, whether or not they have been educated in proper handwashing technique in the last year, and how they perceive their handwashing ability in terms of its effectiveness in reducing dirt and bacteria.

Subjects demonstrated handwashing ability was scored using 13 components (see Table 1) of proper handwashing procedure (Weed, 1989). Demonstrated ability was defined as the raw total of handwashing steps the subject successfully demonstrated out of a total possible for the 13 items.

Organization and Treatment of Data

The data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) for Windows application. A critical value of $p < .01$ was used to determine significance between variables in each of the statistical tests. An independent samples t test was done to compare demonstrated score means for male and female subjects. A Pearson correlation was applied to determine any relationship between the number of times subjects reported washing their hands per day and demonstrated handwashing ability.

Table 1
12 Components Of Proper Handwashing Technique

1. Immersed hands in water
2. Kept fingertips pointed downward
3. Applied soap
4. Held hands lower than elbows throughout washing procedure
5. Worked up a good lather over entire surface of hands
6. Applied soap between fingers
7. Applied soap on both sides of the hands
8. Applied soap to the fingernail beds
9. Rubbed nail beds across opposite hand providing friction
10. Used a rotating and rubbing motion for 15 s
11. Rinsed well with fingertips pointing down
12. Dried thoroughly with a paper towel
13. Turned off the faucet with a paper towel

Demonstrated handwashing ability and perceived handwashing ability were analyzed with a Pearson correlation. Responses for previous handwashing education and demonstrated ability were compared with an independent samples t test.

Results

An independent samples t test between gender and demonstrated ability showed no significant correlation ($p = .956$). No significant relationship ($p = .338$) was found between the number of times students reported washing their hands per day and their demonstrated ability.

A significant correlation was found between perceived handwashing ability and demonstrated handwashing ability ($p = .018$). The relationship between previous education and demonstrated handwashing ability was also found to be significant ($p = .003$).

Discussion

The mean demonstrated ability score was 8.4 out of 13 possible steps. Subject demonstrated ability was positively correlated with the student s self-efficacy in regards to their ability to remove dirt and bacteria from their hands. Further examination into particular steps that were missed and gauging importance for each step would be an important extension of this research. While students on average performed 8 out of 13, certain components not performed may be more important steps in reducing the transmission of disease. Components rarely performed include the application of soap to fingernail beds and rubbing fingernails.

across the opposite hand providing friction to remove bacteria.

The most compelling argument inferred from this relationship is that promoting self-efficacy in risk populations may be an effective measure in controlling the spread of common communicable diseases, such as the common cold and influenza. High levels of self-efficacy among students concerning their handwashing ability will lead to a higher level of performance according to the health belief model (Glanz, Lewis, & Rimer 1990). Health educators may focus on increasing self-efficacy and reducing perceived barriers to handwashing when designing an effective strategy to reduce environmentally spread pathogens.

The spread of disease by touching common environmental surfaces becomes a factor of great importance as students attend class while ill. Hygienic interventions can reduce the transmission of pathogens. Applied epidemiology and preventive medicine must focus on improving health-related behaviors beginning with health education in the schools. Effective infection control practices are important in preventing infection in a population and reducing morbidity and mortality (Denman, 1993). Practicing disease prevention on the college campus will improve health and also decrease health care costs (Wynder, 1994). Handwashing education as a method of disease control can be put into Health and Wellness course curricula to prevent the spread of pathogens on college campuses.

This study shows that students have the necessary skills for handwashing. Future studies should investigate if students are demonstrating them consistently, especially when observers are not watching them. It is difficult for people to perceive that consistent and correct handwashing practices will improve their personal health and the health of the population, even when the individual does not feel ill. Most people do not think about their behavior's impact on an entire population. It is clear that handwashing education is an effective component of promoting health and may be the key to decreasing the spread of common pathogens in college campuses.

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T'ai Chi for Osteoarthritis Among Older Adults

Catherine A. Hartman

Abstract

Osteoarthritis is the most prevalent chronic condition among persons aged 65 years and older and is the most frequently reported cause of disability in the United States (La Plante, 1988). The pain and disability associated with osteoarthritis often prevent individuals from performing valued activities of daily living. This decline in physical function may also impact the psychological, social, and spiritual components of an individual's health. Research indicates that therapeutic exercise programs help to strengthen muscles, increase range of motion, improve flexibility, and increase aerobic capacity in older adults with osteoarthritis. In addition, the ability to engage in physical activity provides older adults with a sense of mastery, control, and self-efficacy which contribute to enhanced self-esteem and well-being. This paper reviews current literature and explores the potential effects of an ancient Chinese conditioning exercise on functional mobility and quality of life in older adults with osteoarthritis.

Introduction

Health is a universally recognized and highly valued state of being. The World Health Organization (1948) identified the various dimensions of health by defining it as "a complete state of physical, mental, and social well-being and not merely the absence of disease or infirmity" (p.??). The goal of health promotion is to ensure a healthy population through disease prevention and the adoption of healthy lifestyles.

By the year 2000, approximately 35 million people over age 65 will represent 13 percent of the population and those over age 85 will increase to a total of 4.6 million (Spencer, 1989). Maintaining both the quantity and quality of life in this increasing number of older persons presents an enormous challenge to the health care system. The national health promotion and disease prevention objectives for the year 2000 include a reduction in the proportion of people aged 65 and older who engage in no leisure time physical activity and a decrease in the proportion of all people aged 65 and older who have difficulty in performing two or more personal care activities (U.S. Department of Health and Human Services[USDHHS], 1995).

As the population ages and older adults live longer, most individuals will live with more than one disabling condition (Quinney, Gauvin, & Wall, 1994). Approximately 85% of individuals over 65 years of age have one or more chronic condition(s) and 42% have functional limitations (Katz, 1983). Osteoarthritis affects an estimated 16 million Americans and is responsible for more than seven million physician visits per year (Arthritis Foundation, 1996). Osteoarthritis is the most prevalent chronic condition among persons aged 65 years and older and is the most frequently reported cause of disability in the United States, accounting for 12.3% of all persons with activity limitations (La Plante, 1988). Prevalence of the condition increases with advanced age and is significantly higher in women than men after the age of 45 years (Arthritis Foundation, 1996). Osteoarthritis in the weight-bearing joints produces the greatest disability and exceeds heart disease as the major reason for physical inactivity among older adults (Minor, 1994).

Osteoarthritis is a degenerative joint disease characterized by deterioration of articular cartilage, sclerosis of subchondral bone, and proliferation of bone spurs (Hoaglund, 1990). The joint instability, muscle atrophy, decreased range of motion, and secondary inflammation related to osteoarthritis contribute to the two most dominant symptoms of pain and functional disability (Dekker, Boot, Van Der Woude, & Bijlsma, 1992). A failure or inability to meet the challenges presented by osteoarthritis pain and disability may result in a lifestyle characterized by immobility, dependency, and compromised quality of life (Dekker et al., 1992; Sharratt & Sharratt, 1994).

Physical Benefits of Exercise

Exercise has been consistently and reliably identified as the health behavior most strongly associated with good health and increased longevity among older adults (McAuley, Shaffer, & Rudolph, 1995). Unfortunately, during periods of increased pain, fatigue, and weakness, individuals with osteoarthritis often reduce their levels of physical activity in the belief that rest will be beneficial. Physical inactivity, however, may instead perpetuate a cycle of chronic pain and increased disability. From a biomechanical perspective, physical inactivity leads to soft tissue stiffness, muscle weakness, and joint instability. Stress on unstable joints may result in increased pain and decreased functional mobility. This outcome perpetuates the cycle by promoting further avoid

ance of physical activity (Dekker et al., 1992).

An integrated program of therapeutic exercise for osteoarthritis includes range of motion, strengthening, and flexibility exercises, as well as low-impact aerobic and aquatic exercises aimed at reducing pain, improving function, and aiding in weight loss (Hochberg et al., 1995; Minor, 1994). Both aerobic and strength training exercises, have been found to be safe and efficacious in individuals with osteoarthritis (Hochberg et al., 1995; Schilke, Johnson, Housh, & O'Dell, 1996). Schilke and colleagues (1996) studied the effects of an 8-week isokinetic muscle-strength-training program on the functional health status of patients with osteoarthritis of the knee joint. Participants who performed strength exercises for the lower legs demonstrated significant increases in strength and mobility and reported significant decreases in pain, joint stiffness, and arthritis symptoms. While strength training and range of motion exercises have long been traditional components of the exercise prescription for osteoarthritis, aerobic weight-bearing activities such as fitness walking have only been advocated in recent years (Kovar et al., 1992). Kovar and colleagues (1992) were the first group of researchers to study the effects of supervised fitness walking in the clinical management of osteoarthritis of the knee. Results indicated that individuals who participated in an 8-week program of supervised fitness walking improved functional status, increased walking distance, decreased medication use, and reported less pain relative to a routine-care group. The evidence is clear that individuals with osteoarthritis who participate in regular physical activity may experience improvements in strength, flexibility, mobility, and aerobic capacity. Small gains in any of these physical variables may make the difference between dependence and independence in the performance of daily activities.

Psychological Benefits of Exercise

The consequences of osteoarthritis are quite complex as the decline in physical function may impact the psychological, social, and spiritual components of health as well (Schoenfeld-Smith et al., 1996). In particular, the functional impairments resulting from osteoarthritis may lead to a diminished sense of control and personal capability that can undermine one's self-esteem and quality of life (Rejeski & Shumaker, 1994). Self-esteem is one psychological variable shown to benefit greatly from regular exercise (Sonstroem & Morgan, 1989). Physical self-efficacy has been identified as the instrumental component necessary for self-esteem change through exercise (Sonstroem & Morgan, 1989). Thus, it is important to examine the psychological effects of exercise on well-being from the theoretical framework of self-efficacy. Bandura (1977) defines self-efficacy as an individual's belief that he or she is capable of successfully engaging in a behavior required to produce a certain outcome or to satisfy situational demands. Self-efficacy is theorized to influence an individual's initial decision to approach an activity, the amount of effort put forth, and the degree of persistence demonstrated in the face of obstacles and barriers (Bandura, 1977).

One theory for the psychological benefits of exercise suggests that improved physical fitness or ability to engage in physical activity provides people with a sense of mastery, control, and self-efficacy (Bandura, 1977). In Sonstroem and Morgan's model (1989) for observing exercise and self-esteem interactions, self-esteem is depicted as a multifaceted and multidimensional psychological construct in which changes in one component may predict changes in another component. Physical self-efficacy constitutes the base level of the model and is crucial for changes in the second level components of physical competence and physical acceptance. Together these three components are vital for changes in global self-esteem which represents the highest point in the model (Caruso & Gill, 1992). Therefore, exercise may contribute to an increase in physical self-efficacy which ultimately leads to enhanced self-esteem.

Furthermore, enhanced self-efficacy for a specific behavior may improve related areas of current and future health status (Bandura, 1977). More specifically, increases in an individual's self-efficacy for exercise behavior may be associated with more positive well-being and improved quality of life (Hogan & Santomier, 1984; McAuley et al., 1995). Hogan and Santomier (1984) found that the mastery experience of a learn-to-swim program increased swimming self-efficacy among older adults. In addition, enhanced swimming self-efficacy generalized to other behaviors and attitudes such as doing chores more easily, feeling more confident in physical abilities, and the belief that one is never too old to learn a new skill.

The exercise and self-esteem model may be especially applicable to older adults who suffer from osteoarthritis. As individuals age and the symptoms related to osteoarthritis progress, decrements in functional mobility and physical activity can be explained by both a reduction in biological function and by a regression of physical self-efficacy (McAuley & Rudolph, 1995). Furthermore, physical impairments and functional limitations may adversely affect general well-being and increase the risk for morbidity and mortality among older adults (Jette & Branch, 1985). Exercise can play a critical role in improving physical self-efficacy, self-esteem, and health-related quality of life among older adults with osteoarthritis.

T'ai chi as a Health Promoting Exercise

T'ai Chi is an ancient form of a classical conditioning exercise that has been practiced in China throughout the centuries for health promotion and self-defense (Liang, 1977). The fundamentals of T'ai Chi are based on a holistic approach to health that promotes awareness of a balanced mind-body relationship. The performance of T'ai Chi involves a continuous sequence of dancelike movements integrated with

concentration of the mind, relaxation of the body, and control of the breath (Liang, 1977). Specifically, T'ai Chi emphasizes slow stepping and shifting of body weight, partial flexion of the knees and hips, maintenance of torso and head in vertical alignment, total body movement, and focused attention on breathing and orientation of the body. The gentle and fluid movements of T'ai chi involve many joints and muscle groups and are especially good for maintaining the mobility and flexibility of the musculoskeletal system (Dahong, 1982).

The two primary components of T'ai chi are physical and cognitive. The physical activity of performing T'ai Chi is equivalent to walking at a speed of six km/hr while the cognitive aspect is similar to quiet meditation done in the sitting position (Zhuo, Shephard, Phyley, & Davis, 1984). Thus, the practice of T'ai chi involves cognitive, cardiovascular, respiratory, and musculoskeletal responses which evoke physiological and psychological changes (Jin, 1989; Jin, 1992). This whole-body exercise may be particularly effective at improving the physical, functional, psychological, and emotional components of health among older adults with osteoarthritis (Brown et al., 1995; Jin, 1992; Zhuo et al., 1984).

For the older adult with osteoarthritis, the cycle of pain and avoidance of physical activity can lead to decreased aerobic capacity, loss of lower extremity strength, diminished range of motion, joint instability, stiffness, and impaired balance (Dekker et al., 1992). Each of these factors may contribute to functional disability and an increased risk of falls (Tinetti, Williams, & Mayewski, 1986). T'ai Chi has been reported to successfully reduce the number of falls and fall-related injuries in older adults with functional limitations and lower extremity weakness (Wolf et al., 1996; Wolfson, 1996). Wolf et al. (1996) found that elderly persons who participated in 15-weeks of T'ai Chi training experienced a significant reduction in the number of fall occurrences, lowered systolic blood pressure after a 12-minute walk, increased self-confidence, and less fear of falling than participants in a computerized balance training or education-control group.

The older adult with osteoarthritis may also be concerned with improvements in aerobic capacity, strength, and flexibility in order to perform daily activities such as walking, climbing stairs, and carrying groceries. The practice of T'ai Chi has been reported to successfully increase strength and flexibility in the lower extremities, improve balance, increase peak oxygen uptake, and decrease percentage of body fat (Wolfson et al., 1996; Lan, Lai, Wong, & Yu, 1996). It is not known whether T'ai chi influences functional mobility, self-efficacy, and quality of life in older adults with osteoarthritis. In light of the mechanisms of osteoarthritis, previous studies pertaining to arthritis and exercise, and the principles of T'ai chi, one may speculate that T'ai chi will benefit older adults with osteoarthritis for the following reasons:

1. Low-impact and slow movements prevent excessive load to damaged joints.

2. Continuous arm and leg movements improve cardiorespiratory efficiency.

3. Diagonal movements promote rotation around the hips and improved trunk and pelvis stability.

4. Slow joint movements provide gentle stretching of soft tissues around the joints.

5. Shifting of body weight in bent knee position strengthens lower extremity muscle groups and increases joint stability.

6. Concentration and sensory awareness of body movements contribute to stability and balance.

7. Rhythmical and fluid movements in combination with mental focus promote relaxation of body and mind.

8. The challenge of learning, practicing, and performing a physical activity increases the confidence and self-esteem that lead to independence and improved quality of life.

Conclusion

The consequences of osteoarthritis can be debilitating as pain and disability may negatively impact the physical, psychological, social, and spiritual aspects of health and well-being (Dekker et al., 1992). Unfortunately, few health promotion efforts have been directed toward older adults with chronic conditions such as osteoarthritis. Some widely held myths which have contributed to the exclusion of older adults from health promotion efforts include: (1) the belief that health promotion means the prevention of disease rather than improvement of health status, (2) that older adults are unable to tolerate exercise interventions, (3) that older adults are unwilling to change health behavior, (4) that changes in later life will have only minimal impact on health, and (5) that interventions are not cost effective for the elderly. While disease prevention is an important goal of health promotion, maintaining function and enhancing quality of life are equally important and cost effective objectives for health promotion efforts directed at older adults with osteoarthritis.

The practice of T'ai Chi may be an especially suitable intervention or adjunct therapy for older adults with osteoarthritis because it is inexpensive, safe, easy to learn, and convenient to practice. As a mind-body approach to health, T'ai Chi emphasizes balance and awareness of both physical movements and mental concentration. While T'ai Chi has been practiced as a health promotion activity in China for centuries, it has only recently been recognized by Westerners for its potential health benefits. Health educators who are interested in incorporating T'ai Chi into health promotion programs may be wise to seek out older populations and the health care professional who serve them, with proposals for T'ai Chi classes designed specifically to meet the particular needs of the clients. Further, it is important that classes be taught by an experienced and reputable T'ai Chi practitioner who understands the goals and interests of a specialized audience such as older adults with osteoarthritis. Finally, health educators may benefit themselves by staying abreast of current research, gaining experience in the prac-

tice of T'ai Chi, and embracing the fundamental principles and philosophies of this ancient Chinese practice.

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Unintentional Injury and Adolescents with ADHD (Attention Deficit Hyperactivity Disorder)

Virginia McClelland

Abstract

Unintentional injury is a major health concern especially during adolescence. Literature supports the idea that adolescents, who have been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), may be at greater risk for unintentional injury. The problems involved with diagnosis and treatment of ADHD are discussed along with how ADHD increases the risks associated with unintentional injury. The conclusions suggest possible psychological, educational, and health interventions that could reduce the risks associated with unintentional injury for adolescents with ADHD. The need for collaboration across professional boundaries is paramount for further research and study.

Introduction

According to Dryfoos (1990), many adolescents are at risk of not maturing into responsible adults. She has investigated four major risk factors including delinquency, substance abuse, early childbearing, and school failure. In describing the antecedents for delinquency, Dryfoos (1990) lists hyperactivity as a possible predictor of antisocial behavior leading to delinquency. There seems to be an overlap across the categories of risk with many at risk adolescents participating in several high risk behaviors. Six common characteristics identified by Dryfoos (1990) that predict problem behaviors are: age, expectations of education and school grades, general behavior, peer influence, parental role, and neighborhood quality.

Children with an Attention Deficit Hyperactivity Disorder (ADHD) are usually identified by the characteristics of impulsivity, distractibility, and activity level. Attention Deficit Hyperactivity Disorder is defined as a biologically-based greater need for stimulation, which is generated through sensation-seeking activity, difficulty waiting before responding (impulsivity), and attentional bias toward novel stimulation (Zentall, 1994). The attentional bias to novelty leads to aggressive and emotional behavior and being excited by novelty. The failure to delay responding leads to impulsivity and impatience. The sensation-seeking activity leads to noncompliance, disruption, aggression, and accidents. These characteristics are the antecedents of the major social problems facing adolescents as they strive for maturity.

The problem is to determine if children with attention deficits are more at risk for unintentional injury. Since at risk adolescents are more in danger of falling into the traps of delinquency, substance abuse, teenage childbearing, and school failure, are they also more likely to suffer death or injury because of their high risk behavior? If children with attention deficits are more at risk for the leading health problems facing adolescents, are they more at risk for unintentional death or injury?

In education and psychology, Attention Deficit Hyperactivity Disorder (ADHD) is the topic of many research projects and professional debates. Much is written about the subject. In health education, unintentional injury is well documented. It is also the topic of many research projects and educational programs. However, not much research has been done on attention deficit and unintentional injury. Special populations such as children and adolescents with ADHD need to be studied by health educators and other health professionals. Similarly, education needs input from other disciplines to have a more substantial impact on unintentional injury. Increased collaboration across professional boundaries is called for in order to prevent death and injury to children and adolescents, particularly those with special needs such as ADHD.

It is assumed that Attention Deficit Hyperactivity Disorder exists as a medical entity. Currently, there is a national debate about whether or not ADHD exists or whether it is a social invention (Armstrong, 1995). The high incidence of ADHD in the United States opens many questions for discussion. However, it is assumed that ADHD can be diagnosed and treated. It is also assumed that unintentional injury can be viewed from a public health model and methods of prevention can be used to decrease the incidence of problems resulting from the attention deficit. The prevention of injury for those individuals with ADHD can be a significant contribution to their future.

Unintentional Injury

Unintentional injury is the leading killer of children in the United States. The Children's Safety Network (1995) estimates that unintentional injury kills more than 7,200 children under age 14 each year and permanently disables 50,000 children. More children die from unintentional injury than from all childhood diseases combined (Children's Safety Network, 1995).

More than 35,000 children are seriously injured each day. Children are killed by traffic injuries (occupants, pedestrians, bicyclists), drowning, fires and burns, suffocation, poisoning and choking, unintentional shootings, and falls (Children's Safety Network, 1995). For adolescents aged 15-19, unintentional injury caused 7,085 deaths in 1991 with motor vehicle occupant injuries the leading single cause of death. Other death-causing injuries result from homicide, suicide, drownings, pedestrian injuries, motorcycle and moped injuries, firearm injuries, and poisonings (Children's Safety Network, 1995).

Injuries are the single greatest threat to children. The National Academy of Sciences declared injuries "the neglected disease of modern society" thirty years ago, and ten years ago called injury the principal public health problem (Rivara & Mueller, 1987, p. 13). Statistics regarding fatal injuries are collected at the time of death. Therefore, nonfatal injuries are more difficult to determine. The Child Health Supplement to the 1988 National Health Interview Survey was used to determine the rate of nonfatal injuries to children and youth (Scheidt, et al., 1995). The estimated nonfatal injury rate for children 0-17 was found to be 27 per 100 children. Boys had higher rates than girls and adolescents had the highest rate, which was 38 per 100 children. This means approximately one fourth of children in the United States experience an injury serious enough to be treated medically each year (Scheidt, et al., 1995).

In another study (Rivara, Calonge, & Thompson, 1989), the results were similar. A total injury rate of 247 per 1000 was found for children ages 0-19. Again, males and adolescents had higher rates. The most common injuries were sprains/strains, lacerations/punctures, contusions/abrasions, and fractures. Falls, recreational activities, and competitive sports accounted for the highest injury rates, with injuries due to motor vehicle collisions, burns and other/unknown categories resulting in the most hospitalizations. Poor children had a higher rate of fatal injuries (Rivara, et al., 1989).

As a result of this number one public health threat, injury and injury prevention has become a science unto itself. The Injury Fact Book (Baker, O'Neill, & Karpf, 1984) refers to unintentional injury as the "last of the great human plagues to be the subject of scientific inquiry" (Peterson, Farmer & Mori, 1987, p. 33). The term non-intentional or unintentional injury is now preferred over the use of the word accident because it conveys the idea that injuries are explicable and preventable. Childhood injuries are caused by situations and agents, making them preventable, not random, not unavoidable, and not inexplicable. For example, most pedestrian accidents involving children occur during the hours of 3 to 5 p.m. and occur mid-block for early elementary age children, and at intersections for older elementary school children (Children's Safety Network, 1995).

Garbarino (1988) takes a developmental approach to childhood injury prevention. He refers to dangerous child behavior as the interaction of normal child behavior and situations in which that behavior is high risk. He maintains that much high risk behavior is developmentally linked. For example, infants squirm, roll, and put things in their mouths, which are high risk behaviors, but developmentally appropriate. Similarly, adolescence is a time of experimentation and risk-taking, accounting for the increase in injury at this age.

Attention Deficit Hyperactivity Disorder

Most of the literature on Attention Deficit Hyperactivity Disorder (ADHD) comes from the field of education, psychology, or child psychiatry. Much has been written about a condition that may affect up to 25% of school-age children (Penix, 1991), but little is yet understood. ADHD has had many labels, such as brain damaged, impulse disorder, or hyperkinetic disorder. In 1980, the American Psychiatric Association, in its revised Diagnostic and Statistical Manual of Mental Disorders (DSM-III), changed hyperkinetic reaction of childhood to attention deficit disorder with or without hyperactivity, and then to attention deficit hyperactivity disorder (Ross & Ross, 1982; Nussbaum & Bigler, 1990). The most recent change in DSM-IV was to divide attention deficit hyperactivity disorder into three subtypes, namely, predominantly inattentive, predominantly hyperactive-impulsive, and combined types (Lahey, et al., 1994).

ADHD is the most frequent reason children are referred to mental health or child guidance clinics. Most children are diagnosed between the ages of 8 and 10. The symptoms needed for diagnosis include inattention, impulsivity, hyperactivity, onset by age 7, duration of at least 6 months, and symptoms not due to schizophrenia, affective disorder, or severe or profound mental retardation (Nussbaum & Bigler, 1990). Barkley (1981) provides the following definition:

Hyperactivity is a developmental disorder of age-appropriate attention span, impulse control, restlessness, and rule governed behavior that develops in late infancy or early childhood (before age 6), is pervasive in nature, and is not accounted for on the basis of gross neurologic, sensory, or motor impairment, or severe emotional disturbance. (Barkley, 1981, p. 6)

Depending on various definitions, there are somewhere between 3% and 25% of school-age children with ADHD in the United States today (Penix, 1991). One point of discussion in the literature is the supposedly high incidence of ADHD in the United States compared to the rest of the world, particularly in similar countries, such as England. The problem is one of definition. What is called ADHD in the United States is often called something else, such as conduct disorder, in other countries. ADHD seems to be an identifiable problem in many countries (Barkley, 1981). It was thought that children from Taiwan, for example, showed little incidence of ADHD. However, a study done by Wang, Chong, Chou, and Yang in 1993, found a prevalence of ADHD of

9.9% in school children (boys were 14.9%), and concluded that "the assumption that hyperactivity is uncommon among Chinese children was proven to be unreliable (p. 133)."

Another problem that arises is diagnosis. Usually children are identified as ADHD by physicians, psychologists, or psychiatrists based on information from parents and/or teachers. The oldest and most common scales for assessing and monitoring ADHD behaviors are the Conners Parent and Teacher Rating Scales, and the Achenbach Child Behavior Checklist and Teacher's Report Form. Due to individual differences and the subjective nature of reporting, diagnosis is often inconsistent. Family physicians also differ in their methods of diagnosis. Some require psychological assessments while others rely primarily on parent and/or teacher reports. Throughout the country, some clinics are designed primarily for the diagnosis and treatment of ADHD in children, adolescents, and adults. Many of these clinics are university-related or private clinics, where a comprehensive assessment is suggested, including a medical, educational, and behavioral history, a general physical and neurological examination, sensory screening, and a neurodevelopmental assessment along with other psychological, educational, or medical testing as needed.

The cause of ADHD remains a mystery. Many theories have been postulated, including brain damage, neurotransmitter system dysfunction or imbalance, dysfunction of the reticular activating system, developmental lag, genetic factors, allergic reactions, and other environmental factors (Nussbaum & Bigler, 1990). Since males are more than twice as likely to be diagnosed with ADHD, there may be a sex-linked genetic component to ADHD (Penix, 1991). It is also possible that girls are underdiagnosed (Biederman, Farone, et al., 1994).

The literature indicated that there may be several forms of ADHD. It is now believed that the adult form of ADHD "may have stronger familial etiological risk factors than its pediatric form" (Biederman, et al., 1995). There is also documentation that ADHD with hyperactivity is a different entity than ADHD without hyperactivity (Barkley, Grozunsky & DuPaul, 1992). Children with ADHD who are hyperactive continue to have more conduct and learning problems along with being hyperactive, inattentive, and impulsive. Meanwhile, children with ADHD but are not hyperactive have more difficulty with perceptual-motor speed and processing (Barkley, et al., 1992). As research continues, there will hopefully be clarification of the various complexities that have plagued diagnosis of ADHD.

The three basic forms of treatment of ADHD involve drug therapy (Stimulant Treatment), behavior management (Cognitive-Behavioral Treatment), and training programs for parents and teachers (Behavioral Treatment) (Farmer, 1991). ADHD is most often treated with central nervous system stimulant medications such as methylphenidate (Ritalin), magnesium pemoline (Cylert), and dextroamphetamine (Dexedrine). Drug therapy is not recommended as the only treatment, but rather in conjunction with behavior management and other counseling therapies. The major benefit of using stimulants is their positive effect on the cognitive and social behaviors perceived by parents and teachers as disruptive, impulsive, and socially inappropriate (Barkley, Anastopoulos, Guevremont, & Fletcher, 1991). The mechanism of drug action is thought to be the production of a neurohormone which does not normally occur, causing the increase in focus and attentiveness (Anastopoulos, DuPaul, & Barkley, 1991).

Children with ADHD experience many difficulties. Penix (1991) gives a detailed description of the signs and symptoms of ADHD. Cognitive difficulties include problem solving skill deficits, which may persist or become more pronounced in adolescence. Due to the symptoms of inattention, impulsivity, hyperactivity, rapid mood swings, disorganization, and an inability to complete tasks, these children have trouble in the classroom. They shout out answers, fail to sit in their seats, bother other children, and lose their papers. They often lack self control and act without thinking first. On the playground, they have difficulty following the rules, play too rough, and get into fights. This leads to depression and feelings of low self esteem. Without intervention, these cognitive, academic, and self esteem difficulties lead to antisocial behaviors in adolescence.

Social and conduct difficulties can lead to delinquency, substance abuse, and school failure, not to mention the effects of stress on the family. It is difficult to determine causative factors, but children with ADHD, particularly those accompanied by hyperactivity, seem to have more conduct disorders such as oppositional defiance disorder (68%) and antisocial disorders (39%) (Barkley, et al., 1991). Mannuzza, et al., (1991) reported a higher prevalence of antisocial personality disorders in a group of 101 adult males who had been diagnosed as hyperactive in childhood. There was also an increase in substance abuse but it was determined that the substance abuse was directly related to the occurrence of the antisocial disorders (Mannuzza et al., 1991).

A study by Fischer, Barkley, Fletcher, and Smallish (1993) looked at the adolescent outcomes of hyperactive children. These children with ADHD were at greater risk for family conflicts, retention in grade, low academic achievement, conduct problems, antisocial acts, substance use, emotional problems, and impaired social competence. However, the single most predictive characteristic for these outcomes was aggression (Barkley, Guevremont, Anastopoulos, DePaul & Shelton, 1993). The adolescent outcomes of hyperactive children are greater behavioral, learning, and conduct problems than normal children.

Attention Deficit Disorder and Unintentional Injury

There is no question that children and adolescents diagnosed with ADHD are at greater risk for many of the problems suggested by Dryfoos (1990). With their inattentiveness, their attraction to novel stimuli, their risk-taking, their

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distractibility and impulsivity, it is easy to predict the threat of injury. However, the unintentional injury risk in children and adolescents with ADHD has not been a frequent topic of research.

Janet Farmer (1991) conducted a process analysis of injury risk factors in children with attentional, behavioral, and learning problems. She found that injury occurrence was associated with behavioral characteristics, such as aggression, hyperactivity, and the children's perceptions of injury risks. Higher injury severity ratings were related to decreased vigilance, slowed motor speed, and impulsivity (characteristics of ADHD). Children who were more aggressive had higher rates of near injury and mild injury severity.

The significance of this study resulted from providing evidence that children with ADHD and learning problems differ from other children in their perception of the injury process. The injury process variables consisted of hazard identification, risk assessment, and safety/prevention strategies. In this study, 30 boys (divided into clinical and control groups) were shown videos of hazardous scenes in order to determine their understanding of the injury process. Their parents completed an injury history questionnaire. It was found that both groups recognized hazards equally well, but the clinical group was willing to take more risks. For this reason, personal risk perception may play a role in determining injury risk.

In regards to the injury history questionnaire, no differences were found in terms of the number of accidents. The clinical group had a higher number of repetitions of the same injury. In terms of safety and prevention strategies, the clinical group differed in its ability to generate options for a preventative response to hazards and had less knowledge of safety rules. The control group used more active ways of coping with the hazards, while the clinical group used more passive/avoidant approaches to hazards. The clinical group children perceived themselves as susceptible to less severe injury.

Children with ADHD and learning problems perceived the injury process differently than children without these problems. Process analysis is one way of showing that ADHD puts children at risk for unintentional injury.

A more behaviorally oriented study was done to look at driving-related risks and outcomes of ADHD adolescents (Barkley, et al., 1993). It was found that not only did the individuals with ADHD have increased risks for traffic citations, crashes, and bodily injuries related to driving, but they were reported by their parents to have less frequent use of proper driving skills. An interesting finding in this study is that the greatest number of crashes were caused by individuals with ADHD who had never been treated with stimulant medication. Drivers with ADHD were four times more likely to be involved in a motor vehicle crash. They were seven times more likely to have more than two crashes. Drivers with ADHD were considerably higher risk drivers than the control group.

A recent study involving children with ADHD and bicycle or pedestrian injuries found that children with a variety of personality and behavior traits, which may be attributable to deficits in vigilance, impulse control, or both, are at increased risk for unintentional injuries (Pless, Taylor, & Arsenault, 1995). Until the age of about 12, children underestimate the arrival time of approaching vehicles. This ability is further compromised in children with attention deficits. Not only are these children exposed to greater risk, but their ability to cope with dangerous situations is diminished.

Conclusion

What can be done to prevent the negative consequences that befall children and adolescents with ADHD? Stimulant medication has been suggested as a significant treatment method. Behavioral modification or social learning techniques, such as safety skills training can be utilized to help children and adolescents learn more effective ways of behaving (Farmer, 1991, & Pless, Taylor & Arsenault, 1995). Classroom contingency management and parent training are important components of treatment. Most importantly, parental awareness needs to be increased. In several studies (Farmer, 1991; Barkley, Fischer, Edelbrock, & Smallfish, et al., 1991; & Peterson, 1987), parents of children and adolescents with ADHD did not provide adequate supervision, and were unaware of the seriousness of the risks for injury. Multifaceted approaches, involving changing the environment and legislating or mandating safety measures, along with education and training programs, would be most effective (Peterson & Mori, 1985; Pless & Arsenaut, 1987).

One thing is clear. Much more research needs to be done before the risk of unintentional injury for children and adolescents with ADHD is reduced. The increased risk for death and injury for these children makes it imperative for us to find more effective ways of successfully reducing the risk.

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The Use of Computer-Assisted Instruction In Health Education

Mollie Howerton

Abstract

Health educators use many different instructional techniques in order to motivate students to listen to health messages and make appropriate behavior changes. Computer-assisted instruction is an instructional strategy that may be an effective means of approaching health education. It is more personal in that students may acknowledge their health behaviors on the privacy of their personal computers, without the fear of ridicule from their peers and teachers. In addition, students can explore the consequences of practicing risk-taking behaviors through computer simulations, without actually having done the behavior itself. This paper gives an overview of computer-assisted instruction and discusses why it can be an effective instructional strategy for health education.

Introduction

Health educators need to know how to use a variety of instructional techniques in order to be effective in the classrooms and in the community. Many such instructional strategies already exist and are used widely in health education, ranging from the more traditional teacher-based instruction to cooperative learning activities to the use of video. The use of computers in health education is becoming more widespread, especially with the advent of the Internet and other forms of multimedia. Computer-assisted instruction (CAI), which is a type of instruction that incorporates the student s use of computers for such activities as drill and practice and tutorials, can be a useful instructional strategy in health education. It is a more personal medium than video in that lessons can be tailored towards student needs in addition to having certain characteristics that make it a medium that more health educators should consider. Currently, many computer programs incorporate multimedia into the message design, meaning that animation, graphics, sound, video, and text are part of the instruction. This paper gives an overview of CAI and how it can be useful in health education.

Computer-Assisted Instruction

With the 1980 s bringing the advent of the computer, technology within the classroom has changed tremendously over the past two decades; Between 1985 and 1988, the number of computers in the classrooms of the United States increased from 800,000 to 1.7 million (U.S. Congress, Office of Technology Assessment, 1989; Swan & Mitrani, 1993). Today, the number is still increasing, with the 1995 projected number of computers being 5.8 million (U.S. Congress, Office of Technology Assessment, 1995). As a result, teaching strategies have evolved to become more individualized, cooperative, and student-centered (Swan & Mitrani, 1993). This new style of teaching runs counter to the traditional lecture-and-text based model of teaching and learning, which some argue has worked since the 16th century s advent of the printing press. They further argue that this traditional lecture-and-text model of teaching and learning should not be changed.

Despite the arguments of some professionals that CAI runs counter to traditional teaching methods and should thus be abandoned, CAI can be an effective teaching tool since it encourages students to be active participants in their learning. In CAI, participants interact with a computer, as compared to using video for instruction with which participants are passive recipients of the instruction. Students become more responsible for their learning with CAI as compared to the traditional classroom instruction in which the major responsibility for learning rests with the teacher (Swan & Mitrani, 1993).

An important component of CAI is that it is non-threatening, non-judgmental, and impersonal (Nickerson, 1994). This feature is important because it allows students who are involved in risky behaviors, such as cigarette smoking, to learn about the ill-effects of their health behaviors in a non-discriminatory manner, without the fear of ridicule and confrontation from other students and disappointment from their teacher.

Motivation

Motivation gives the learner an intrinsic desire to learn and may be based on need, interest, or desire. Good computer software programs motivate students to participate in the activity in addition to providing learner control (Knapp & Glenn, 1996). Participants have more interest and improved attitudes toward the topic, thus making learning more effective (Knapp & Glenn, 1996). Therefore, computer-mediated learning products can motivate students to listen to the message concerning such health behaviors as cigarette smoking in addition to changing or reinforcing their attitudes toward not participating in the risk-taking behavior.

Further, students who are motivated to learn will learn the

material better (Nickerson, 1995). Computer-assisted instruction may better grab the attention of learners because it is different from the traditional lecture-and text-based model. Computer programs are becoming more sophisticated on a daily basis. Instead of being mostly drill-and-practice and tutorials, simulations and games are being incorporated into the instruction. Many of these simulations and games use multimedia as part of its message design, making computer-assisted instruction a more fun type of instruction. Computers have an advantage over other types of instructional strategies in that many people enjoy playing with the computer. If students find the medium through which the health information is being delivered as motivational or fun, then they are more likely to listen to the message.

An important component of learner motivation is the fact that learners need a safe and supportive environment in order to learn. Students who feel threatened in their learning environments, such as the fear of ridicule if their responses are incorrect, or in health education, against the student norm, will not be motivated to learn the material (Nickerson, 1996). If role play, for an example, is simulated on the computer, students can respond to the simulated situations in a manner that is realistic for them. They do not have to worry about the teacher s or students reactions to their responses. They can learn how situations affect their behaviors and how their behaviors affect situations. For example, students who smoke or who are considering beginning smoking can go through a computer simulation of what it is like to be a smoker without actually having smoked a cigarette. They are rewarded for the short-term perceived social benefits of smoking such as feeling sophisticated and being accepted by a particular peer group. However, the simulation will also move them through the negative consequences of smoking: being a social outcast, having a suppressed immune system, reduced physical fitness, and nicotine addiction. This scenario is not the traditional drill-and-practice scenario associated with computer-assisted instruction in health education. A computer simulation can provide just as much information as the drill-and-practice or tutorial, but the approach is more non-threatening and less likely to make the learners defensive about their health practices. If they are less defensive while participating in the health instruction, then they are more likely to listen to the health message.

From an instructional design standpoint, the ability to motivate the learner may be a more important element than the design itself (Venezky & Osin, 1991). If a learner is not motivated to learn, then he or she will not. Therefore, the design should create an interest in the learner by presenting the information in a motivating manner. It should promote learner curiosity. If the learner does not have a specific need to learn the information, then it should promote an interest in learning more about the material by encouraging the learner to ask questions and continue with the product. Curiosity may be promoted by new events (Venezky & Osin, 1991). If learners see something new, or if novel concepts are presented, then they will hopefully be motivated to learn more about the new concept. However, if too much new information is presented at one time, it may be overwhelming to the learners, thus facilitating their ending the computer-mediated learning session. Attribution theory plays an important role in developing learner motivation. This theory addresses how learners connect their own successes and failures with luck, ability, or effort (Venezky & Osin, 1991; Weiner & Kukla, 1970). Attribution theory is important because it deals with learner self-esteem. In order to encourage learner motivation, a computer-assisted learning product should emphasize the learner s ability and effort in the successful completion of the task.

With regards to computer-assisted instruction, academic gains, learning rates, and learning retention rates increase when conducted in coordination with teacher-based instruction (Cotton 1991, as reported in Knapp & Glenn, 1996). In addition, an advantage to computer-assisted instruction is that students can review the information as many times as they feel is necessary in order to improve their understanding of the material. When computer-assisted instruction is used with teacher-based instruction, student learning and attitudes can be very positive (Knapp & Glenn, 1996).

Learning Theories

Learning theories are important to any discussion of computer-assisted instruction (CAI) because they have greatly influenced its development over time. The foundation of CAI is based on the behaviorist approach to instruction, with CAI later expanding to incorporate the cognitivist approach. Today, the cognitivist approach is more prevalent among the models that use psychological foundations. (Tobias, 1992). Another approach, the constructivist approach is a paradigm that is often used in instructional design and is currently under hot debate. One theory that is not really discussed, but should be mentioned is the eclectic approach to instructional design, which is an approach that utilizes more than one of the above paradigms in the development of instruction.

Behaviorism

The behaviorist approach to instruction is based on the "analysis of observable responses and their related environmental conditions" (Gredler, 1992, p.75). It is a theory that was popular in the early years of instructional design. B.F. Skinner's reinforcement theory, also known as operant conditioning, was the only "neo-behaviorist" theory to be successful in both the laboratory and the classroom (Gredler, 1992). His theory is based on the fact that people learn behaviors through reinforcement. In contrast to Pavlov s classical conditioning, in operant conditioning people s responses are more voluntary, and therefore, more receptive to rewards. Thus, the shaping of behaviors is based on the reward system. An example of operant conditioning in instructional design is the use of computer-assisted instruction (CAI).

Computer-assisted instruction s original principles were based on the behaviorist theory of learning. In many of the traditional CAI programs such as drill-and-practice and tutorials, students learn through the immediate reinforcement of correct responses.

Cognitivism

Whereas the behavioral paradigm offered a clearly described model of learning, a cognitive paradigm is less clear because of the various interests of the competing cognitive learning theories. Certain models focus on memory organization, while others direct their attention to memory retrieval systems.

Jean Piaget, a Swiss psychologist, profoundly influenced the professional understanding of the psychology of learning with his cognitive development theory. His components of knowledge development—assimilation, accommodation, and equilibration—illustrate how the learner adjusts and regulates his or her knowledge base.

The learning environment is an important part of using the cognitivist principles. Learners are both active participants and in control of their learning processes by constantly monitoring, planning, or revising themselves. Learners are encouraged to make knowledge meaningful by establishing connections with materials they already know. Also, knowledge is structured and sequenced in order to maximize learning outcomes, with materials or procedural steps being broken down into hierarchies of the prerequisite skills.

The cognitivist theory of learning is applied to computer-assisted instruction in the form of self-directed learning. Instead of instruction being based on the design of instructional materials as in the behaviorist theory, instruction is based on the learner. In terms of CAI, when learners are presented with information on their computer screen, they can manipulate that knowledge in any form they desire in order to understand abstract relationships (Brown, Hedburg, & Harper, 1994). Computers are viewed more as a tool in the cognitivist approach to CAI than as a tutor as in the behaviorist approach (Jonassen, 1993).

Constructivism

The constructivist paradigm involves active learning through exploration and discovery. Learners are placed more in real world situations, making knowledge based on experience. There is no shared reality (Merrill, 1992). What people recognize as knowledge is constantly changing based on their experiences. Students learn better from information that they construct themselves versus information that was fed to them (Nickerson, 1996; Piaget, 1974). Teachers act as guides and resources to student questions in the constructivist-based classroom. Some examples of constructivist learning activities are cooperative learning experiences, role play, field trips, and simulation. In computer-assisted instruction, hypermedia and multimedia are often the tools used to help learners construct their knowledge of the world (Jonassen, 1993). Hypermedia and multimedia involve the use of digitized video, audio, and animation in computer software.

Summary

Several learning theories have contributed to the development of computer-assisted instruction, with some of the more relevant theories including the behaviorist, cognitivist, and constructivist approaches to instruction. With the behaviorist approach, CAI was developed to be a tutorial or drill-and-practice type of instruction. With the cognitivist approach, CAI became more user-centered versus instruction-centered. Learners were more in control of their learning as compared to the instruction controlling their learning. With the constructivist approach, learning became more experiential, or learning evolved from the learner s experiences. With regards to CAI, a constructivist approach incorporates games and simulations as part of its instructional strategy.

Computer-assisted instruction can play an important role in health education. If instructional strategies are designed so that they are constructivist in nature, then learning may be improved. Learners may gain more positive attitudes towards the health message and hopefully delay, prevent, or stop any risk-taking behaviors. If instructional designers are to use a constructivist model towards health education, then they should design the instructional strategy to make students feel like they are learning about particular health behaviors and their effects, such as cigarette smoking, through their experiences with simulated computer situations, classroom role play, and group projects. An important note to remember is that students, especially middle school aged students, need guidance from the teachers. Constructivist activities, such as those that can be provided by CAI simulations, classroom-based role play, and group projects are important in enhancing learning. However, if there is no teacher guidance, student knowledge on health practices will not be as complete as it would be with teacher-based instruction (Nickerson, 1996).

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Violence Prevention
A Health EducatorÕs Perspective

Susan C. Hill

Abstract

Violence, including violence in schools, has become a public health problem. Health educators can play an important role in helping make schools and communities safer, by leading in coordinated services in schools and communities.

Introduction

A 15-year-old male entered an Ellensburg, Washington high school, gunning down his math teacher and two students. In Scotland, a gunman went into a school randomly shooting, killing 16 elementary students and a teacher. A confiscated 20-minute videotape graphically showed four teenagers roaming the nighttime streets of suburban San Fernando Valley, randomly choosing people or vehicles to bash with a bat or shoot with a high-pressure paint gun. These are just a few examples, widely covered in the media, of the extreme and deadly acts of youth violence that plague today's society. Violence is now considered an epidemic in the United States (Stevens, 1994). It is no longer restricted to inner cities, it is spreading to rural and suburban areas as well. In addition, an increasing number of violent acts involve children and teenagers, either as perpetrators or victims.

Violence in Schools

In the past, schools have been viewed as a safe and nurturing environment for children. In some areas, this perception has changed, as many schools are no longer considered safe. According to a report from the National Crime Prevention Council (1995), approximately 37% of violent crime against youth occur at or near schools.

Some experts agree that school violence is a product of our violent modern day society (Newman & Newman, 1980). It also has been stated that the increase in school violence mirrors that of society in general (Soriano, 1994). There are numerous societal issues present in schools as increasing numbers of students are bringing their weapons, drugs, grudges, problems, anger, and potential for danger to school with them (Curico & First, 1993). It would be, however, unreasonable to single out schools as the exclusive solution to the violence epidemic.

How Health Educators Can Help

Schools can help prevent violence by having health education courses that teach students about conflict resolution, anger management, decision making, negotiation, communication, goal setting, and interpersonal social skills. In addition, health educators can be a valuable resource for implementing peer mediation programs, establishing counseling programs, and developing and supporting school policy on violence. To have a lasting impact on reducing violence, however, these resources must be extensions of or supplemented with community-based violence prevention programs.

Research indicates the most successful violence prevention programs value a multidisciplinary effort. This approach includes public schools, health agencies, health education programs, school staff (including school custodians, cooks, and parent teacher organizations), the medical community, religious leaders, sociologists, politicians, and law enforcement personnel. In addition, parental involvement is one of the most important variables in the success of most violence prevention programs (Fiester, Nathanson, Visser & Martin, 1996; Guerra, 1994; Stevens, 1994). All individuals who interact with youth must be involved to effectively bring about a change in attitudes regarding how people treat one another.

The progress of our society hinges on creating safe, nonviolent environments in which to raise our children. It has been said that it takes a village to raise a child. Parent and community involvement in violence prevention programs are early and highly important steps toward attaining the goal of safe schools and communities. Health education offerings are the perfect stepping stone for these programs. One area of focus for such programs might include teaching children and parents stress and anger management skills.

Violent children tend to come from violent families. Children who do not possess skills to manage stress and anger in their lives are more likely, as parents, to behave violently toward their children. Children who witness parents resolving conflict through violent behavior are likely to learn to solve their problems and personal conflicts in the same manner (Page, Kitchin-Becker, Solovan, Golec, & Hebert, 1992). Thus, children who cannot manage their stress and anger

are at an increased risk of becoming violent with other children. Teaching children stress and anger management skills reduces the possibility that they will become confounded with life's responsibilities, and vent their frustrations on other children (Fortune, 1994/1995). Teaching children nonviolent conflict resolution skills increases the odds that they will be empowered to model and accentuate the value of nonviolent behavior for their peers and their future families. In order for these skills to be taught effectively, health educators need to have adequate training in violence prevention.

Teach Teachers to Help

A greater focus needs to be placed on violence prevention in teacher preparation programs. Teacher preparation is an important and sometimes neglected aspect of violence prevention programs. A lack of teacher preparation in violence prevention may be related to inadequate coverage, or neglect of violence prevention in school health education curricula. A survey of 200 health coordinators, in three northwestern states, found 77.5% reported that violence prevention was not addressed at all or addressed very little in university health education teacher training programs (Page, Marten & Follett, 1995, p. 350) In addition, a high proportion of high schools in the sample did not include violence prevention education or included it only minimally in their formal health education curricula (Page, Marten & Follett, 1995, p. 403).

Conclusion

Through coordinated services, adequate comprehensive school health curricula development, appropriate teaching methods, teacher inservice training programs, and violence prevention courses and workshops in conjunction with community violence prevention programs, health educators have opportunities to become part of the solution. Active participation, a positive force, and powerful influence can be created by health educators to advance the prevention of violence. Providing children with positive, nonviolent models, and teaching them the necessary skills before they become adults, can help achieve the desired goal of safer schools and communities.

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Reviewers

Dr. Emmanuel Ahua
Center for Community Health
University of Southern Mississippi
Hattiesburg, MS 39406

Dr. Robert Bensley
4024-5 SRC
Health Education Department.
Western Michigan University
Kalamazoo, MI 49008

Dr. Linda Balog
State University of New York
College at Brockport
350 New Campus Drive
Brockport, NY 14420

Dr. Kelli McCormack Brown
Department of Community and Family Health
College of Public Health
MDC 56
University of South Florida
Tampa, FL 33612

Dr. Brian Colwell
Department of Health Education
Texas A & M University
College Station, TX 77843

Dr. Carolyn Cox
327 Pershing Building
Truman State University,
Kirksville, MO 63501

Dr. Steve Dorman
PO Box 118210
Department of Health Science Education
University of Florida
Gainesville, FL 32611

Dr. Stanley Snegroff
Health Studies Department
Woodruff Hall
Adelphi University
Garden City, NY 11530

Dr. Bobbie Ogletree
Department of Health Education and Recreation
Southern Illinois University
Carbondale, IL 62901

Dr. Marianne Frauenknechr
4024-6 SRL/HPER
Western Michigan University
Kalamazoo, MI 49008

Dr. Jodi Brookins-Fisher
Pearce 113
Department of Health Promotion and Rehabilitation
Central Michigan University
Mt. Pleasant, MI 48859

Dr. D. Craig Huddy
Department of HCES
Appalachian State University
Boone, NC 28608

Dr. Michael Kelly
College of Nursing and Health Sciences
1101 North Campbell Street
El Paso, TX 79902

Dr. Dianne Kerr
316 White Hall
P O Box 5190
Kent State University
Kent, OH 44242

Reviewers (cont.)

Dr. Susan Massad
Department of Health Studies
263 Alden Street
Springfield College
Springfield, MA 01109-3979

Dr. Kelli McCormack-Brown
Department of Health Sciences
106B Moulton Hall
Illinois State University, 5220
Normal, IL 61790-5220

Dr. Kweethai Chin Neill
Department of Health and Kinesiology
P.O. Box 2176
Sam Houston State University
Huntsville, Texas 77341

Dr. Anthony V. Parrillo
Department of Health Education
Minges Coliseum, A-11
East Carolina University
Greenville, North Carolina 27858

Dr. Robert M. Weiler
Department of Health Science Education
P.O. Box 118210
University of Florida
Gainesville, FL 32611-8210

Dr. Bryan Williams
UMDNJ/PERC
EOHSI, Room 236
681 Frelinghuysen Rd.
Piscataway, NJ 08855-1179

Dr. Judith Luebke
Health Science Department
MSU BOX 50
PO Box 8400
Mankato State University
Mankato, MN 56002

Dr. Beverly S. Mahoney
19A White Building
Department of Health Education
Pennsylvania State University
University Park, PA 16802

Dr. Jim McKenzie
Ball State University
Muncie, IN 47306.

Dr. Ranjita Misra
328 Pershing Building
Health and Exercise Science
Truman State University
Kirksville, MO 63501

Dr. Michele Johnson Moore
Department of Public Health
Western Kentucky University
1 Big Way

Contributors

Susan Thomas is a Masters Degree student at the Department of Health Science Education and a member of Alpha Lambda Chapter at the University of Florida, in Gainesville, Florida.

Crystal Bieterman is a student and a member of Gamma Rho Chapter at Truman State University in Kirksville, Missouri.

Susan Hill is a Doctoral Candidate and a member of Alpha Alpha Chapter at Southern Illinois University at Carbondale, Illinois.

Kirk Baker is a student at Truman State University in Kirksville, Missouri.

Mollie Howerton is a doctoral student and a member of Nu Chapter at Indiana University in Bloomington, Indiana.

Liliana Rojas is a Masters Degree student at the Department of Health Science Education and a member of Alpha Lambda Chapter at the University of Florida, in Gainesville, Florida.

Catherine Hartman is a graduate student and a member of Gamma Omicron Chapter of the Health Promotion and Wellness Program at Springfield College.

Virginia McClelland is a Doctoral student and a member of Rho Chapter at Kent State University in Kent, Ohio.

ETA SIGMA GAMMA
CL325
2000 University Avenue
Muncie, Indiana 47306

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